SIMRAD

NSO-II

Operator Manual

ENGLISH

simrad-yachting.com

Preface

As Navico is continuously improving this product, we retain the right to make changes to the product at any time which may not be reflected in this version of the manual. Please contact your nearest distributor if you require any further assistance.

It is the owner's sole responsibility to install and use the instrument and transducers in a manner that will not cause accidents, personal injury or property damage. The user of this product is solely responsible for observing safe boating practices.

NAVICO HOLDING AS AND ITS SUBSIDIARIES, BRANCHES AND AFFILIATES DISCLAIM ALL LIABILITY FOR ANY USE OF THIS PRODUCT IN A WAY THAT MAY CAUSE ACCIDENTS, DAMAGE OR THAT MAY VIOLATE THE LAW.

Governing Language: This statement, any instruction manuals, user guides and other information relating to the product (Documentation) may be translated to, or has been translated from, another language (Translation). In the event of any conflict between any Translation of the Documentation, the English language version of the Documentation will be the official version of the Documentation.

This manual represents the product as at the time of printing. Navico Holding AS and its subsidiaries, branches and affiliates reserve the right to make changes to specifications without notice.

Copyright

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Warranty

The warranty card is supplied as a separate document.

In case of any queries, refer to the brand website of your display or system:

www.simrad-yachting.com

Declarations and conformance

This equipment is intended for use in international waters as well as coastal sea areas administered by countries of the E.U. and E.E.A. For more information refer to the separate NSO-II Installation manual.

About this manual

This manual is a reference guide for operating the Simrad NSO-II systems. It assumes that all equipment is installed and configured, and that the system is ready to use.

The manual assumes that the user has basic knowledge of navigation, nautical terminology and practices.

The manual does not cover basic background information about how equipment such as radars, echo sounders and AIS work. Such information is available from our website: www.simrad-yachting.com/en/Support/Library.

Important text that requires special attention from the reader is emphasized as follows:

→ ***Note:*** Used to draw the reader's attention to a comment or some important information.

> ⚠ **Warning:** Used when it is necessary to warn personnel that they should proceed carefully to prevent risk of injury and/or damage to equipment/personnel.

The software

This manual is written for Simrad NSO-II Release to Market 1 (RTM1). Please check website for details on release version.

→ ***Note:*** The About dialog above is an example only and may not match the software installed on your unit!

The manual will be continuously updated to match new software releases. The latest available manual version can be downloaded from www.simrad-yachting.com

pdf viewer

A pdf viewer provides the opportunity to read the manuals and other pdf files on the NSO-II screen. NSO-II manuals can be downloaded from www.simrad-yachting.com to an SD card or USB stick and then copied to the unit's internal memory.

To maneuver in the pdf, use softkeys and multi-touch gestures as shown below:

Search, Page Up/ Down		Tap the relevant softkeys
Scroll pages		Touch screen and smoothly move one finger up/down or left/right
Panning on page		Touch screen and smoothly move one finger in any direction
Zoom in		Touch screen and smoothly drag two fingers away from each other
Zoom out		Touch screen and smoothly drag two fingers together
Exit the pdf viewer		Tap the **X** in the upper right corner

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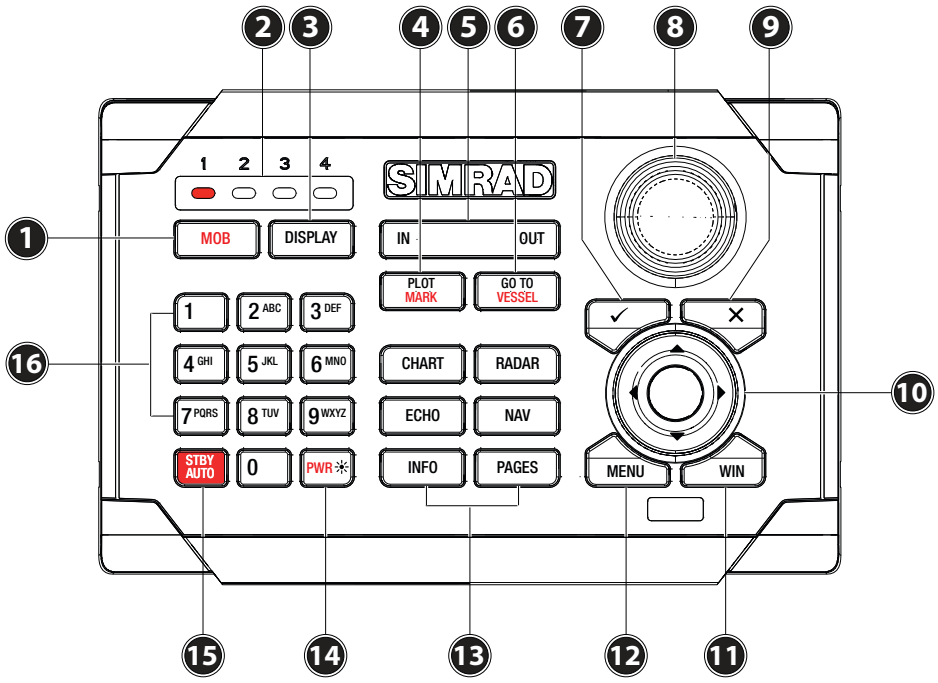
1 Introduction

OP40 Remote Control of NSO-II

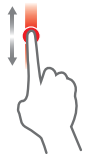
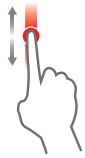
Connecting an OP40 Remote Controller to NSO-II will enable a combination of key operation and multi-touch gestures to operate the functions of the NSO-II. For details on connection and setup, refer to separate OP40 manual.



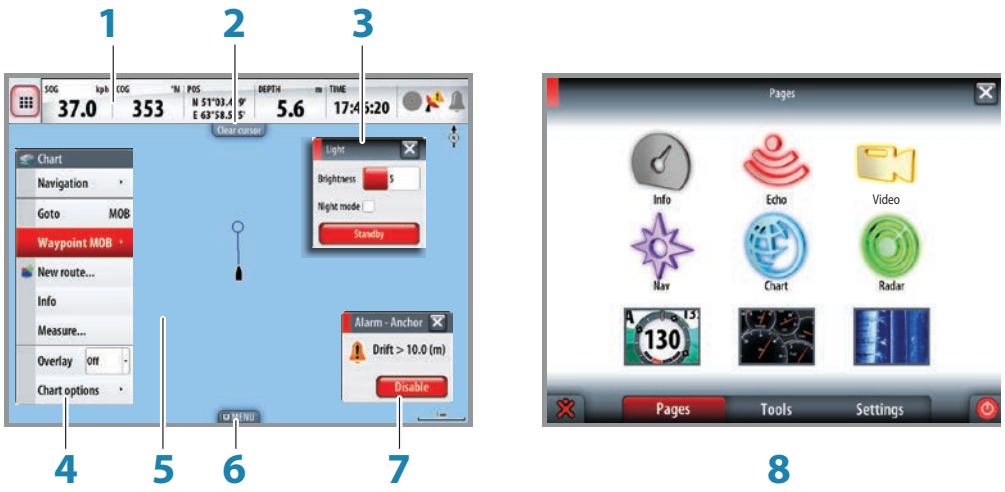
Key	Description
1	MOB (Man Overboard). A long press will position a Man Over Board (MOB) waypoint at the vessel's current position
2	Display under command LEDs. Indicates which display the OP40 is controlling.
3	DISPLAY: A short press changes which display the OP40 is controlling. A long press (5 sec.) turns on all NSO/NSO-II units on the network, and enters OP40 configuration and system startup
4	PLOT/MARK key. A short press activates the Plot menu, a long press positions a waypoint at the vessel position
5	Zoom IN zoom OUT buttons for radar, echosounder and chart pages
6	GOTO/VESSEL key. A short press activates the Goto menu, a long press centers the chart to vessel position
7	✓ key activates/confirms current selection
8	Rotary knob. The function of the knob is depending on active context
9	X key cancels changes and returns to previous menu level
10	Cursor keypad. Used to move the cursor on the display, and to maneuver in the menu system
11	WIN key. Used on multiple panels pages. A short press toggles between the panels, a long press expands active panel to a full page panel and back again
12	MENU key. Used to display the context menu for the active panel/overlay, and for selecting options in edit mode. 2 x MENU for accessing system settings menu
13	Direct Access Keys (DAK). Provide direct access to a page. Repeated presses of each DAK cycles through several different pages that relate to the DAK
14	PWR key. Used to turn the NSO-II system on/off and to display dialog for light adjustment, night mode and standby mode
15	STBY AUTO: Autopilot Auto steer/Stand-By
16	Alphanumeric keypad used for entering numbers and text in dialog boxes

Touch terminology and icons

Multitouch gestures are predefined motions used to interact with multitouch devices. The gesture-function-pairs which applies to the NSO-II are listed below.

Term	Icon	Description
Tap		Tap screen once e.g. on chart item to show basic information on item or tap a checkbox to set the option on/off.
Double tap		Tap screen twice e.g. double-tab the **MENU** panel button to show the Settings dialog
Long press		Tap and hold your finger on the screen for xx seconds to activate the cursor assist option
Scroll		Touch screen and smoothly move one finger up/down or left/right e.g. scroll through a list of available options without activating any option
Flick		Same motion as Scroll, only *rapidly* flick/swipe one finger on the screen to quickly scroll through e.g. the waypoint list. Tap the screen to stop the scrolling. ☞ the listing keeps scrolling after the finger has left the screen
Pan		Touch screen and smoothly move one finger in any direction to pan the chart
Pinch		Touch screen and smoothly drag two fingers together to zoom out on the chart
Spread		Touch screen and smoothly drag two fingers away from each other to zoom in on the chart

NSO-II screen layout



See "Customizing your system" on page 100 for further information

1 Instrument bar

Navigation and sensor info can be viewed in a user configurable instrument bar at the top of your screen. The button in the top left corner will call up the Pages overview panel (Home).

2 Panel button

You can tap the text on this area to end an ongoing operation, e.g. to remove the cursor from the screen, to end route editing and to stop measuring distance.

3 Dialogs

Dialogs are used for user input or for presenting information to the user.

A dialog may be presented in full-screen or as a popup dialog in the centre of the screen. Depending on type of information or entry, different steps are applied to confirm, cancel and close the dialog.

A dialog can always be closed by tapping the ☒ in the upper right corner.

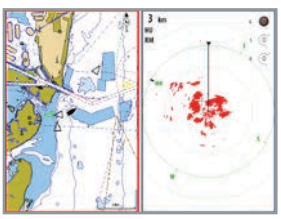
4 Menus

Different menus are available to select options and to configure your system. A menu is displayed by tapping the **MENU** panel button, or by tapping and holding on the touchscreen.

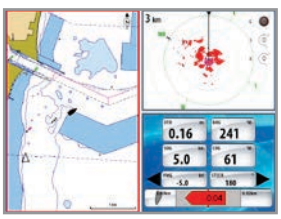
5 Application panels

Each application connected to the system is presented in panels, and you can have several panels presented on the screen at the same time, all depending of what combination is most suitable at the moment e.g.

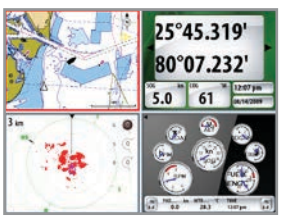
1-panel page



2-panels page



3-panels page



4-panels page

The system includes the following page groups, which each have a pre-configured combination of panels:

Icon	Description	Main page
	Instruments with configurable live data from system internal, and external sources such as engines	Instruments
	Echosounder	Echosounder
	Live video	Video
	Navigation information	Steering
	Insight, CMAP MAX-N or Navionics charts, depending on region, plus supporting NV digital charts as well	Chart
	Radar	Radar

See "Customizing your system" on page 100 for further information

The main page in each group is a full size panel. All pre-configured pages, except the main page for the group, can be modified by the user.

In addition to these panels the following applications can be connected and displayed in other panels:

Panel	Description
AIS	AIS information as overlay on chart and radar panels
Weather	Sirius (North America only) weather graphics and data as overlay on chart panel
Audio	Satellite radio (North America only) and SonicHub functions as a panel along the bottom of a page

6 MENU panel button

Tapping this panel button will display the menu for the active panel.

See ""Alarm system" on page 90 for further information

7 Alarm message

The system will continuously check for dangerous situations and system faults while the system is running. When an alarm situation occurs, an Alarm dialog will pop up.

If you have enabled the siren, an audible alarm will be activated when an alarm situation occurs.

8 Control pages

The Control pages give access to page selection, tools and settings.

The **Pages** overview panel (**Home**) is displayed by tapping the **PAGES** button to the left of the instrument bar.

You can also switch between the control panels by dragging your finger horizontally on the screen.

All control panels and sub-panels are always full screen, and they will open on top of your previous page. When you close one of these panels the display will return to last active page.

Pages overview (Home page)

Tools

Settings

Pages overview

The pages overview panel is accessed from any operational mode by tapping the **PAGES** button.

The panel includes 6 page group icons together with shortcuts to the autopilot panel, to a combined chart/echo panel, and to the StructureScan panel.

If a CZone system is connected, this function is accessed from the Home page.

➔ ***Note:*** To see an autopilot panel an AC12/42 or SG05 autopilot computer must be connected to the system.

Tools

The tools panel include options that are not specific to any panel e.g. status regarding vessels, alarms, satellites, sun/moon and tides. Also included are waypoints, routes and tracks library, trip log, sun/moon status, find function and files.

Settings

The Settings panel gives access to system and vessel setup, application settings, and to the simulator.

2

Basic operation

Turn power on/off

Use the power switch on the front of the NSO Processor or press the **PWR** key on the OP40 Remote Control to turn the NSO-II system on/off.

Advanced power control
The NSO-II can be wired and configured to control the power of displays and compatible devices. See the NSO-II Installation manual for more information.

More features via the power key

	• Press the OP40 **PWR** key or tap the power button on the Pages panel	Display dialog for brightness, night mode, standby mode and radar standby/transmit
	• Drag to adjust slider value / repeat pressing the OP40 **PWR** key	To change the brightness level / toggle preset brightness levels

→ ***Note:*** If the power key is released before shut-down is completed, the power off is cancelled.

A night mode which optimizes the color palette for low light conditions, is included.

→ ***Note:*** Details on the chart may be less visible when the Night mode is selected!

When in Standby mode, the backlight is turned off to save power.
You return from Standby mode to normal operation by pressing the OP40 **PWR** key.
If the radar is transmitting you can set it to standby mode from within the **Light** dialog.

Using the touchscreen

Basic touchscreen operation on the different panels is shown in the table below.
The panel sections later in this manual have more information about panel specific touchscreen operation.

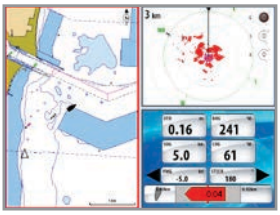
Operation	Menu/ Dialogs	Panels: Chart	Echo	Radar
Tap	Select/ toggle item	Place cursor		
Press and hold		Display menu for active panel		
Drag	Adjust slider value Scroll dialog	Pan chart (any direction)	Pan echo history (horizontal movement)	

→ ***Note:*** When pressing the screen and holding your finger on the same spot, a circle will spin around the point. Don't let go till action circle is completed or until the action is confirmed by a second beep.

Pages and panels

Select pages

You access a page group and then select the page to display from the **PAGES** panel.



Select active panel

In a split screen you have multiple panels, but only one panel can be active at a time. You will only be able to access the context menu of the active panel. The active panel is outlined with a red border.

You can switch between active panels by tapping the required panel or pressing the OP40 **WIN** key.

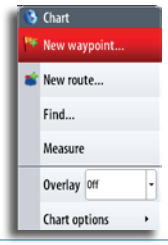
Menus

Menus are used to operate the system and to adjust settings.

To call up a menu:

- Press the panel button or OP40 **MENU** key

- Press and hold on active panel



- You select a menu item and toggle on/off menu check boxes by tapping selected item.
- You adjust slide bar values by tapping the item and then dragging your finger on the slide bar. The value can also be adjusted by turning the OP40 rotary knob.
- Drop-down listings are selected by tapping the item and then the selected value.

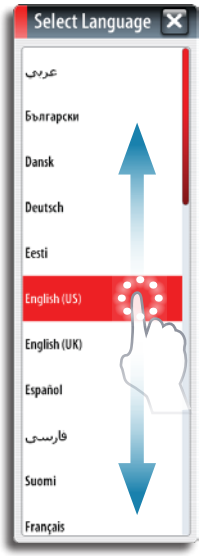
Check box

Slide bar

Drop-down listing

From the OP40 Remote Controller you can also operate a menu by using the rotary knob to select menu item, and then press the knob to confirm your selection.

By pressing the **X** key the menu will return to previous menu level, and then exit. You can also close a menu by tapping the screen outside the menu area.



Dialog boxes

You select entry fields and keys in a dialog box by tapping the screen or by using the OP40 rotary knob. You can only enter information when a field is selected and highlighted.

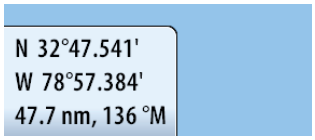
Some dialog listings might extend beyond the screen area. These dialogs will include a scroll indicator, and you scroll by dragging the list or turning the OP40 rotary knob.

Numeric and alphanumeric keyboard will automatically be displayed when required for entering user information in dialogs. A virtual keyboard is operated by tapping the virtual keys.

A dialog is closed by tapping the ☒ in the upper right corner.

Placing the cursor

The cursor is by default not shown on any panel.



You tap the screen to place the cursor on a Chart, Radar or Echosounder panel. The cursor information window will show position coordinates at the cursor position, and range and bearing to the vessel.

On an Echosounder panel, the cursor information window will include the depth at cursor position.

Further use of the cursor is described in the Chart, Radar and Echosounder sections.

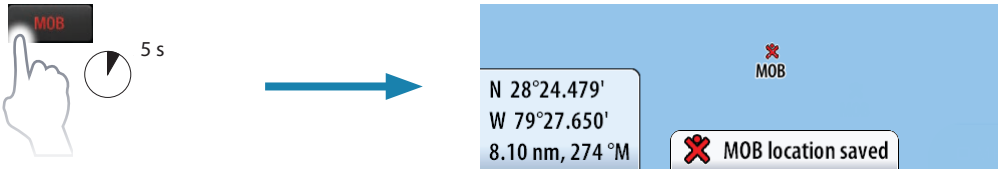
To remove the cursor and cursor window from the panel, press the **X** key or tap the **Clear cursor** panel button.

Positioning a Man Over Board mark

If an emergency man over board situation should occur, you can position a MOB mark at the vessel's current position by pressing the OP40 **MOB** key for about 5 seconds.

When you activate the MOB function the following actions are automatically performed:

- a MOB mark is positioned at the vessel's position
- the display switches to a zoomed chart panel, centered on vessel's position
- the NSO-II creates an active route to the MOB mark



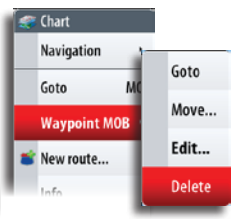
Positioning multiple Man Over Board marks

The NSO-II allows for positioning multiple Man Over Board marks.

Multiple MOB marks are positioned by repeatingly pressing the OP40 **MOB** key. The vessel will continue to navigate towards the initial MOB mark until the waypoint is reached, or until you stop the navigation. Navigation to subsequent MOB marks will need to be done manually.

Cancel navigation

The NSO-II will continue navigating towards the MOB point until the waypoint is reached or until navigation is cancelled.



Delete a MOB mark

A MOB mark is deleted by selecting the MOB mark and then activating the menu.

It can also be deleted as described in "Waypoints, routes & tracks" on page 26.

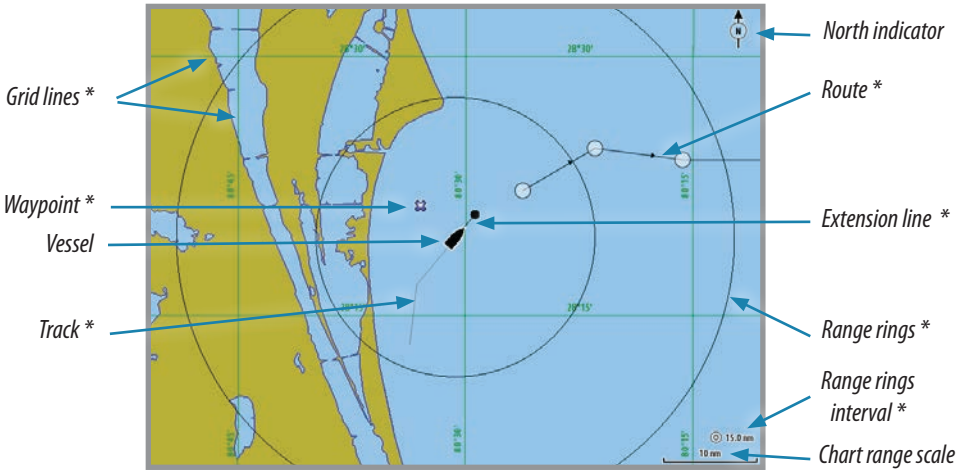
3 Charts

The chart function displays your vessel's position relative to land and other chart objects. On the panel you can plan and navigate routes, place waypoints, overlay a radar image or weather information, and display AIS targets.

The NSO-II has different embedded cartography depending on region. Units sold in America will include Insight cartography, while units sold in other regions will have an embedded basemap plus a cartography SD card. Depending on region, the cartography options available are CMAP BDS or downloadable Navionics or CMAP for Europe. All units will support Navionics Platinum Plus and TurboView via the SD Card slot on the NSO Processor. Charts are shared over the network, so only one chart card per boat is required.

The first part of this section describes common usage of the charts. Chart options depend on type of cartography. For more details, see further ahead in this section.

Chart panel



* Optional chart items

→ *Note:* You turn the optional images on/off individually. See "Chart settings panel" on page 19.

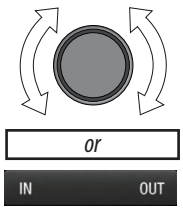


Chart scale

You zoom in and out on the chart by using the **IN/OUT** keys or by using the rotary knob on OP40.

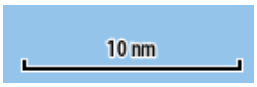
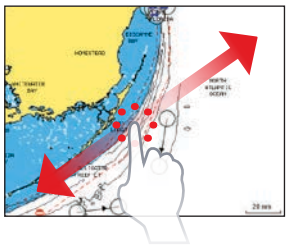


Chart range scale and range rings interval (when turned on) will be shown in the lower right corner of the chart panel.

Panning the chart

You can move the chart in any direction by tapping the screen and smoothly move your finger in the desired direction., or use the 4-way cursor on OP40.



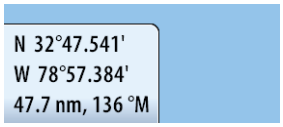
Tapping the **Clear cursor** button will remove the cursor from the panel, and the chart center will be positioned at the vessel.

Vessel symbol

Position and orientation

When a GPS and a suitable heading sensor are connected to the system, the vessel symbol indicates vessel position and heading.

Without a heading sensor fitted, the vessel icon will orientate itself using COG (Course over Ground). If no GPS is available the vessel symbol will include a question mark.



Using the cursor on the chart panel

The cursor is by default not shown on the chart panel.

When you tap the screen, the cursor will become visible and the cursor position window will be activated. When the cursor is active, the chart will not pan or rotate to follow the vessel.

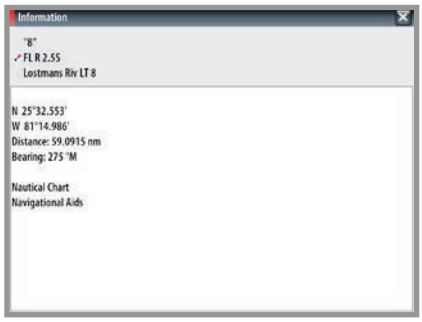
To remove the cursor and cursor window from the panel, press and hold the OP40 **VESSEL** key or tap the **Clear cursor** panel button, which also will center the chart to vessel position.

Displaying information about chart and chart objects

When you tap a chart item, a waypoint, a route or a target, basic information for the selected item will be displayed.

By pressing and holding your finger on a chart item, all available information for that item will be shown.

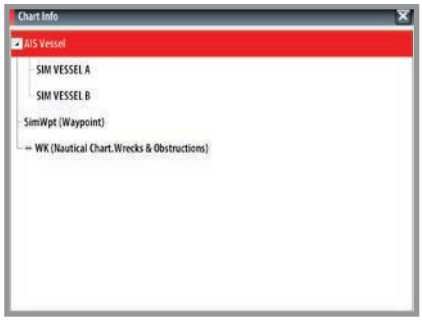
The information can also be displayed by using the menu.



→ ***Note:*** Popup information has to be enabled to see basic item information.

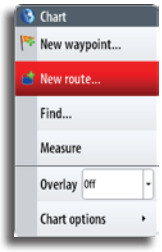
If the cursor is not active, available information for objects close to the vessel can be displayed.

If no information is available, the Info menu item will not be shown.



Placing waypoints

You place a waypoint by tapping the chart panel on the selected position and then activating the menu.



Creating routes

You can quickly create routes by tapping the chart panel.

1. Activate the menu
2. Tap the screen to position the first routepoint, and then continue tapping the screen to place the remaining routepoints
3. Save the route by tapping the **Finish editing** panel button or by activating the menu

See "Waypoints, routes & tracks" on page 26 for more information about waypoints and routes.

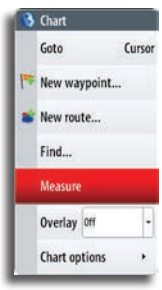
Dragging waypoints

1. Tap the waypoint to make it active
2. Drag the waypoint to the new position

The waypoint position will automatically be saved.

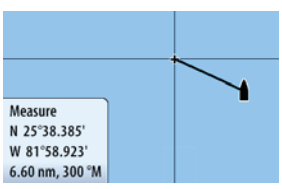
Measuring distance

The cursor can be used to measure the distance between your vessel and a selected position, or between 2 points on the chart panel.



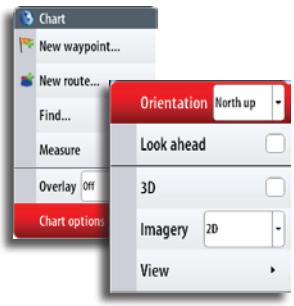
1. Tap the screen on the place to where you want to measure the distance from the vessel
2. Start the measure function from the menu

- A line will be drawn from the vessel center to the cursor position, and the distance will be listed in the Cursor Information window



3. Reposition the measuring points by tapping and dragging the icon at either end.

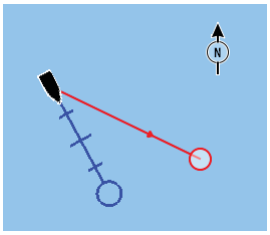
You terminate the measuring function by tapping the **Finish measuring** panel button.



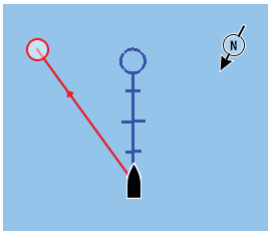
Positioning the chart on the panel

Chart orientation

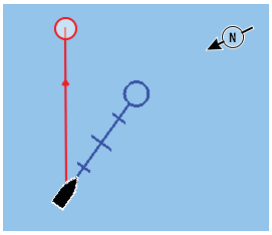
Several options are available for how the chart is rotated in the panel. The chart orientation symbol in the panel's upper right corner indicates the north direction.



North up



Heading up



Course up

North up

Displays the chart with the north direction upward. Corresponds to the usual orientation of nautical charts.

Heading up

Displays the chart with the vessel's heading directly up on the chart image. Heading information is received from a compass. If heading is not available, then the COG from the GPS will be used.

Course up

Rotates the chart in the direction of the next waypoint when in navigation mode. This option works only when there's an active route. If no route is active the heading up orientation will be used until a route is made active.

Look ahead

This option centres the chart slightly forward of your vessel so that you can maximize your view ahead.

Chart settings panel

Settings and display options made in the Chart settings page are common for all chart panels.

For optional chart panel settings, refer the illustration on page 17.

3D boat selection

Determines which icon to use on 3D charts. See "Chart panel" on page 17.

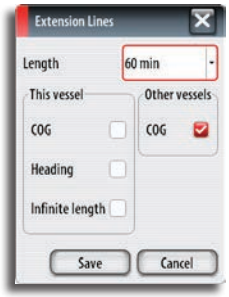
Range Rings

Turns on/off range rings on the chart.

The range rings can be used to present the distance from your vessel to other chart objects.

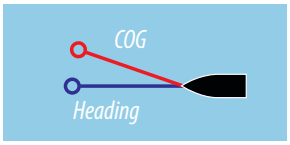
The range scale is set automatically by the system to suit the chart scale.

Vessels' extension lines



Sets the length of the extension lines for your vessel and for other vessels shown as AIS targets.

The length of the extension lines are either set as a fixed distance, or to indicate the distance the vessel will move in the selected time period.



Own vessel heading is based on information from the active heading sensor and COG from active GPS sensor.

For other vessels COG data is included in the message received from the AIS system.

Synchronize 2D/3D chart

Links the position shown on one chart with the position shown on the other chart when a 2D and a 3D chart are shown side by side.

Pop-up information

Selects whether basic information for chart items shall be displayed when you tap the item.

Grid lines

Turns on/off viewing of longitude and latitude grid lines on the chart.

Waypoints, Routes, Tracks

Turns on/off displaying of these items on chart panels.

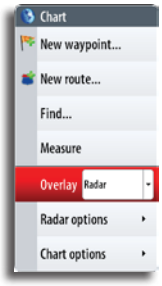
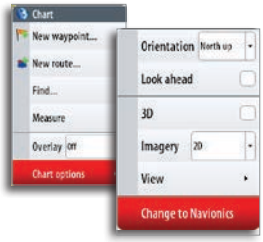


Chart overlay

Radar, Structure, AIS and weather information can be displayed as overlay on your chart panel.

When radar or weather overlay is selected, the chart context menu will be expanded to include basic function for the selected overlay.

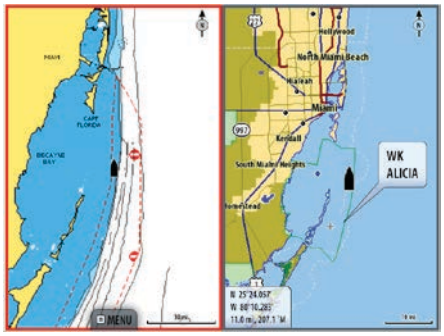
Radar, weather and AIS functions are described in separate sections in this manual.

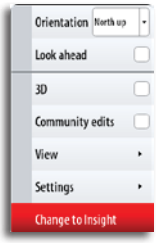


Selecting chart type

Chart type is selected from the chart options menu, and the selection is set individually for each chart panel.

If you have Navionics charts available in the SD card slot, you can show Navionics and Insight charts simultaneously in a split screen.





→ ***Note:*** To show C-Map charts, you need to select **Insight** chart type in the menu.

If Insight chart is embedded and you have a C-MAP card in the slot or on the Ethernet network, the system will automatically select the chart with most chart details for your displayed region.

The same applies if you have two Navionics charts available.

Chart data

The NSO-II can use Navionics Platinum Plus and TurboView via SD Card Slot accessible from the NSO Marine Processor box.

Charts are shared over the network, so only one chart card per boat is required.

→ ***Note:*** The system will not automatically switch to embedded cartography if the SD card is removed. A low-resolution chart will be displayed until you re-insert the SD card or manually switch back to embedded cartography.

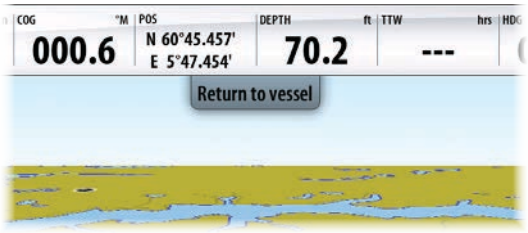
3D charts

There are two 3D view options available:

- Rotate - default view keeping the boat in center on the chart panel
- Pan - allows you to move the 3D chart view away from the vessel

You toggle between these two options by tapping the pan and rotate icons. Active option is indicated with red icon.

You return to default **Rotate** view by tapping the **Return to vessel** panel button.



Rotating 3D chart

In this view the camera position is fixed, and the camera can only be rotated and tilted.

Be default the vessel's position will be in center if **Look Ahead** is not selected. The camera angle is as seen from your eye position, looking toward the vessel. The vessel's rotation on the chart is defined by the chart orientation settings.

You can change the camera's tilt angle by dragging your finger on the screen with vertical motions. You rotate the camera around it's own vertical axis by dragging your finger horizontally on the screen.

→ *Note:* You can only rotate the camera if you have panned away from default vessel position, that is when the **Return to vessel** panel button is available.

Panning

The **Pan** option allows you to view the entire 3D chart, regardless of vessel position.

You move the camera away from the vessel and around in the chart by dragging your finger on the screen. When you remove your finger from the screen the view will remain in the selected position.

The camera's tilt angle is as set in **Rotate** view.

Zooming

You zoom in and out on a 3D chart by using the **IN/OUT** keys or the rotary knob on OP40.

Insight and CMAP chart options

When working with CMAP cartography, you need to select Insight, as Insight and CMAP chart options are identical.

Chart orientation

See page 19.

Look ahead

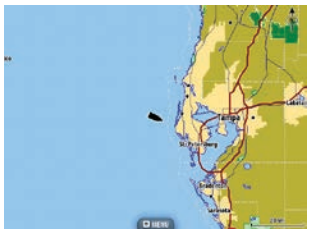
This option centres the chart slightly forward of your vessel so that you can maximize your view ahead.

3D

See "3D charts" on page 21.

Chart imagery style

The charts can be displayed in two different imagery styles, either as 2D basic mapping style, or with shaded relief presenting chart including terrain imaging.



2D

Shaded relief

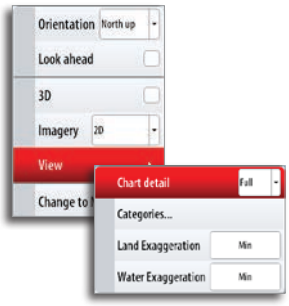


Chart detail

Low

This is the basic level of information that cannot be removed, and includes information that is required in all geographic areas. It is not intended to be sufficient for safe navigation

Medium

This is the minimum information sufficient for navigation

Full

This is all available information for the chart in use

Categories

Insight charts includes several categories and sub-categories that you can turn on/off individually depending on which information you want to see on your display.

Land Exaggeration and Water Exaggeration

Graphical settings available in 3D mode only. Exaggeration is a multiplier applied to the drawn height of hills on land, and troughs in water to make them look taller or deeper.

Navionics chart options

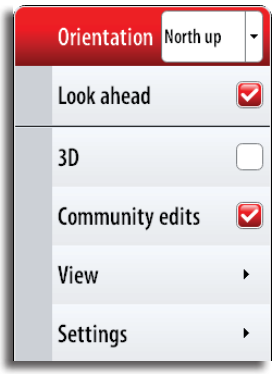


Chart orientation and Look ahead

See page 19.

3D

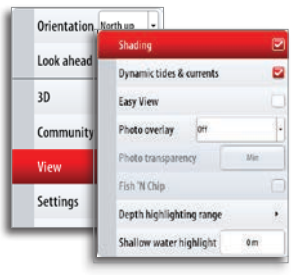
See "3D charts" on page 21.

Community edits

Toggles on the chart layer including Navionics edits. These are user information or edits uploaded to Navionics Community by users, and made available in Navionics charts.

For more information refer to Navionics information included with your chart, or to Navionics website: www.navionics.com .

Chart view

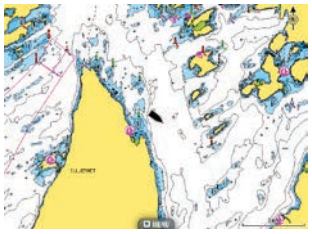


The built in Navionics chart database provides you with detailed coastal cartography, with 2D and 3D view options.

- 2D presents chart information in a basic mapping mode with Navionics details
- 3D provides a three dimensional graphical view of land and sea contours

Chart shading

Shading adds terrain information to the chart.



Traditional 2D chart

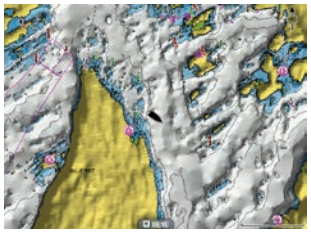
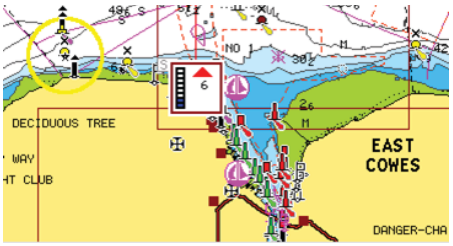


Chart with shading

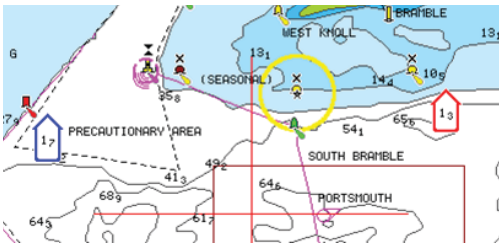
Dynamic tides and currents

Shows tides and currents with a gauge and an arrow instead of the diamond icons used for static tides and current information.

The tide and current data available in Navionics charts are related to a specific date and time. The NSO-II animates the arrows and/or gauges to show the tides and currents evolution over time.

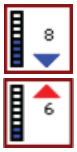


Dynamic Tide information



Dynamic Current information

The following icons and symbology are used:

Icons	Description
	Current speed. The arrow length depend on the rate, and the symbol is rotated according to flow direction. Flow rate is shown inside the arrow symbol. Red symbol used when current speed is increasing,- blue symbol when current speed is decreasing.
	Tide height. The gauge have 8 labels and is set according to absolute max/min value of the evaluated day. Red arrow used when tide is rising,- blue arrow when tide is falling.

→ ***Note:*** All numeric values are shown in the relevant system units (unit of measurement) set by user.

Easy View

Magnifying feature increasing the size of chart items and text.

In the split screen image below the **Easy View** is turned ON in the right panel.

→ ***Note:*** There is no indication on the chart showing that this feature is active.

Photo overlay

Photo overlay enables you to view satellite photo images of an area as an overlay on the chart. The availability of such photos is limited to certain regions.

You can view photo overlays in either 2D or 3D modes.

No Photo overlay

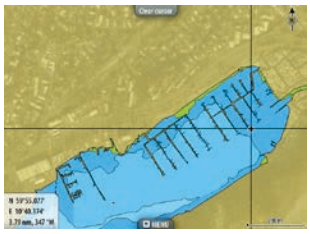
Photo overlay, land only

Full Photo overlay

Photo transparency

The Photo transparency sets the opaqueness of the photo overlay. With minimum transparency settings the chart details will be almost hidden by the photo.

Minimum transparency



Transparency value = 10

Navionics Fish'n Chip

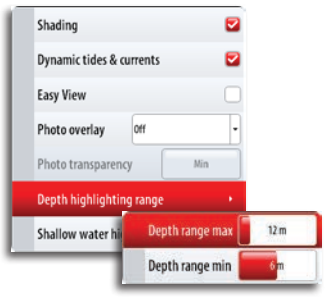
NSO-II supports Navionics Fish'n Chip (US only) chart feature.

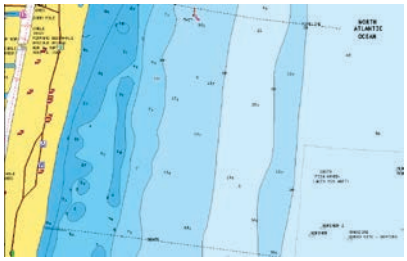
For more information, see www.navionics.com.

Depth highlight range

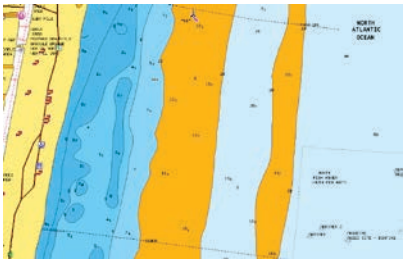
Select a range of depths between which Navionics will fill with a different color.

This allows you to highlight a specific range of depths for fishing purposes. The range will only be as accurate as the underlying chart data, meaning that if the chart only contains 5 meter intervals for contour lines, the shading will round to the nearest available contour line.





No Depth Highlight Range

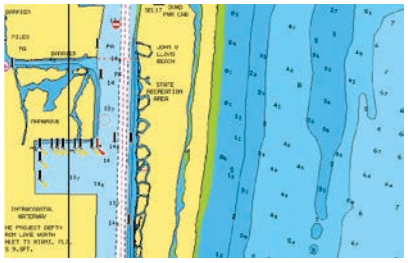


Depth Highlight Range, 6 m – 12 m

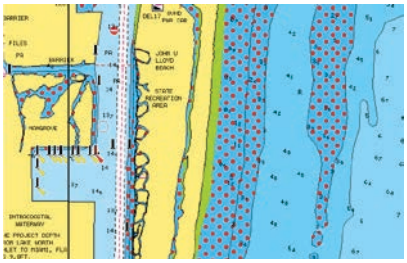
Shallow water highlight

Highlights areas of shallow water.

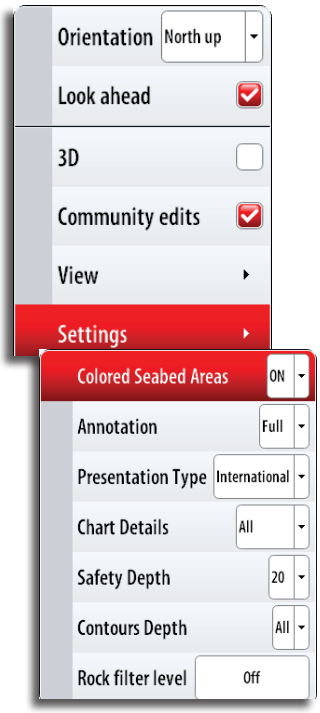
This allows you to highlight areas of water between 0 and the selected depth (up to 10 meters/30 feet).



No Shallow water highlighted



Shallow water highlight, 0 m – 3 m



Navionics chart settings

Colored Seabed Areas

Used for displaying different depth areas in different shades of blue.

Annotation

Determines what area information, such as names of locations and notes of areas, is available on display.

Presentation type

Provides marine charting information such as symbols, colors of the navigation chart and wording for either International or US presentation types.

Chart details

Provides you with different levels of geographical layer information.

Safety depth

The Navionics charts use different shades of blue to distinguish between shallow and deep water.

The safety depth sets the limit for which depths that shall be drawn without blue shading.

→ ***Note:*** The built in Navionics database features data down to 20 m, after which it is all white.

Contours depth

Determines which contours you see on the chart down to the selected safety depth value.

Rock filter level

Hides rock identification on the chart beneath a given depth.

This helps you to declutter charts in areas where there are many rocks located at depths well below your vessel draught.

4

Waypoints, routes & tracks

Waypoints

A waypoint is a user generated mark positioned on a chart, on a radar image or on an echosounder image. Each waypoint has an exact position with latitude and longitude coordinates. A waypoint positioned on an echosounder image, will in addition to position information have a depth value.

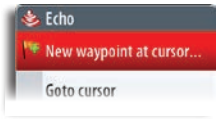
A waypoint is used to mark a position you later may want to return to. Two or more waypoints can also be combined to create a route.

Positioning waypoints

Placing a waypoint at vessel position

You can position a waypoint at the vessel position from any panel by pressing and holding the OP40 **PLOT/MARK** key.

Using the cursor to position waypoints



On chart, echosounder and StructureScan panels you can place a waypoint on a selected position by making a long press on the screen to activate the panel menu.

Edit waypoints

A selected waypoint can be deleted or edited on a chart panel from the menu, or from the waypoint dialog.

You can quickly move a waypoint on a chart panel by tapping the desired new location on the screen.

Using the edit waypoint dialog

This dialog is activated by tapping the waypoint and then activating the menu, or pressing the rotary knob when the waypoint is selected.

The dialog can also be activated from the Waypoint list. See "Waypoints, route and tracks panels" on page 28.

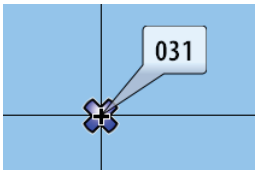
Waypoint alarm settings

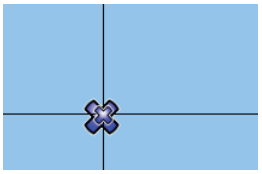
You can set an alarm radius for each individual waypoint you create.

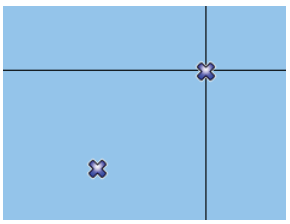
→ ***Note:*** The waypoint radius alarm must be toggled ON in the alarm panel to activate an alarm when your vessel comes within the defined radius.

Moving a waypoint by tapping the screen

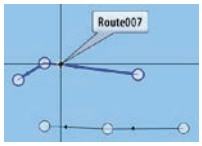
1. Select the waypoint by tapping it
2. Activate the menu and select the move option
   - The waypoint icon will change to indicate moving mode
3. Tap on the chart panel to select a new position
4. Confirm the new position by tapping the **Finish moving** panel button or by pressing the OP40 rotary knob.







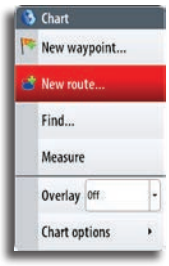
Routes



A route consists of a series of routepoints entered in the order that you want to navigate them.

When you tap on an existing route, it will turn blue and the route name will be displayed.

Creating new routes



1. From the new route option from the menu
2. Tap the panel to position the first waypoint
3. Continue tapping the chart panel until all routepoints are positioned
   - A waypoint can easily be re-positioned by dragging it to the new position
4. Save the route by tapping the **Finish editing** panel button or by using the options in the menu.

The route can also be created from the Routes panel described later in this section.

Edit a route

A route and a waypoint can only be edited from the chart panel when the item is selected.

1. Tap the route to make it active
2. Activate the menu and select the route and edit option
3. Tap the panel to add a new routepoint

- If you tap on a leg a new point will be added between existing routepoints
- If you tap outside the route the new routepoint will be added after the last point in the route

4. Drag a routepoint to move it to a new position
5. Save the route by tapping the **Finish editing** panel button or by using the options in the menu.

→ ***Note:*** a single routepoint can be moved by tapping the routepoint and then selecting the move option in the menu.

Tracks

A track is a graphical presentation of the historical path of the vessel, allowing you to retrace where you have travelled. A track can be converted to a route in the Tracks panel, as described later in this section.

From the factory, the system is set to automatically draw a track. The system will continue to record the track until the track length reaches the maximum trail point setting, and will then automatically begin overwriting the oldest track points.

The automatic tracking function can be turned off from the Tracks panel described later in this section.

Creating a new track

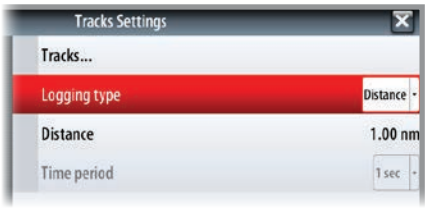
You define the track settings and start the new track from the Tracks Settings dialog described below.

Track settings

The track is made up of a series of track points connected by line segments whose length depends on the frequency of track recording.

You can select to position track points based on time settings, distance, or by letting the NSO-II system position a waypoint automatically when a course change is registered.

→ ***Note:*** The Tracks option must also be turned ON in the chart settings to be visible.



Waypoints, route and tracks panels

The Waypoints, Routes and Tracks panels gives access to advanced edit functions and settings for all these items available on your system.

The edit and settings options are accessed from the menu or by using the dialog buttons when one of the items is selected.

5 Navigating with the NSO-II

The navigation function included in the NSO-II allows you to navigate towards the cursor position, a waypoint or along a predefined route.

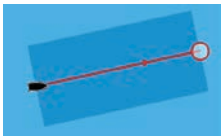
For information about positioning waypoints and creating routes, refer "Waypoints, routes & tracks" on page 26.

Goto menu

You can start navigation from any panel by using the **Goto** menu, press the OP40 **GO TO** key.

➔ *Note:* The Goto cursor option will only be available when the cursor is active on a Chart, Radar or Echosounder panel.

When the NSO-II starts navigating, the cross track limits will be indicated on the chart. See "Navigation settings panel" on page 30.



Navigating on the chart

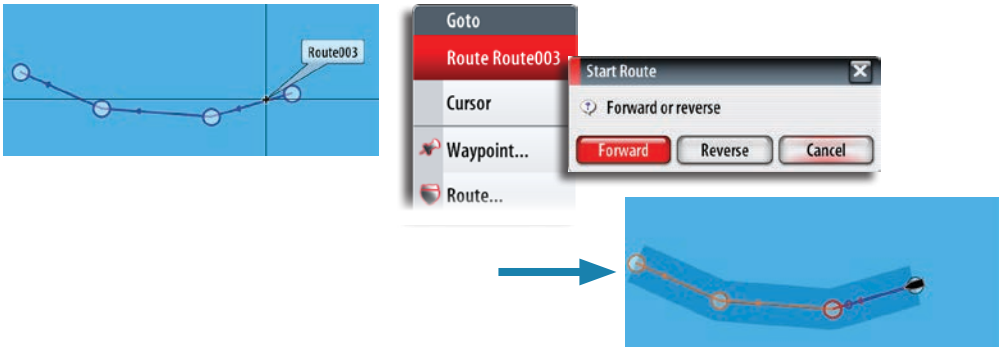
You can start navigating on the chart from the chart menu and from the **Goto** menu. The description and the illustrations below show use of the **Goto** menu, activated by pressing the OP40 **GO TO** key.

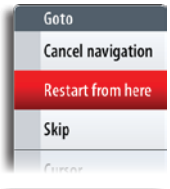
Navigate to cursor position

You can start navigating towards a point on the chart by tapping the selected destination, activating the **Goto** menu and selecting the cursor option.

Navigate a route

You can start navigating a route by tapping the route and then activating the **Goto** menu.

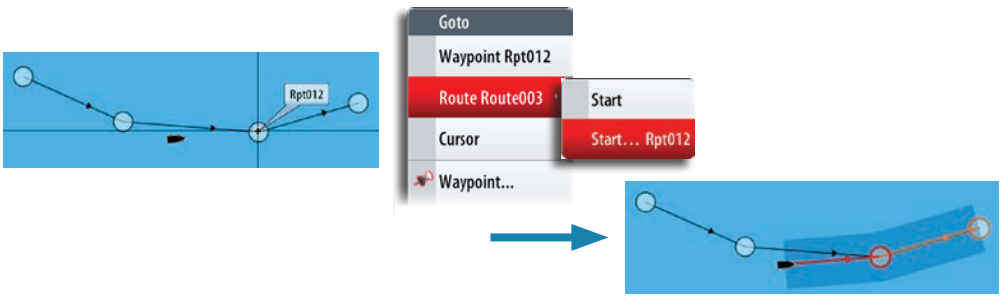


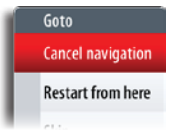


When route navigation is started, the **Goto** menu will expand showing options for skipping a waypoint, or for restarting the route from current vessel position.

Selecting start point

You can navigate a route, starting from any waypoint, by positioning the cursor over the selected waypoint and activating the **Goto** menu.





Cancel navigation

You cancel navigation from the **Goto** menu or the chart panel menu.

Navigating with the autopilot

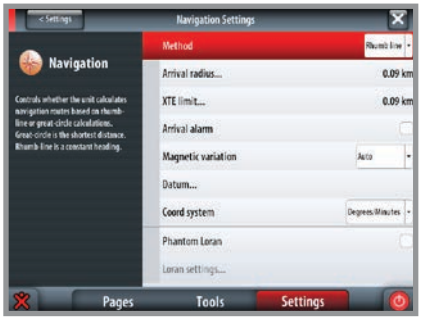
If an AC12, AC42 or an SG05 autopilot computer is connected to the system, autopilot functionality will be included in the NSO-II.

When you start navigation on a system with autopilot functionality, you will be prompted to set the pilot to navigation mode.

If you choose not to engage the autopilot, the pilot can later on still be set to navigation mode from the pilot menu.

For more information about autopilot functionality see "Autopilot" on page 33.

Navigation settings panel



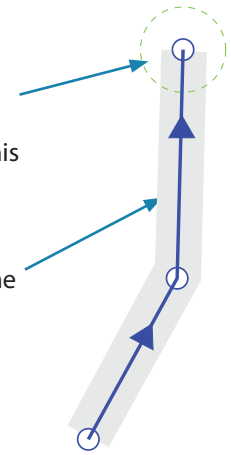
Navigation method

Different methods are available for calculating the distance and bearing between any two points on a chart.

The great-circle route is the shortest path between two points. However, if you are to travel along such a route, it would be difficult to steer manually as the heading would constantly be changing (except in the case of due north, south, or along the equator).

Rhumb lines are tracks of constant bearing. It is possible to travel between two locations using Rhumb line computation, but the distance would usually be greater than if Great circle is used.

Steering alarm limits



Arrival radius

Sets an invisible circle around the destination waypoint.

The vessel is considered arrived at the waypoint when it is within this radius.

Off course (XTE) limit

This parameter defines the vessel's accepted offset distance from the leg. If the vessel goes beyond this limit an alarm will be activated.

Arrival alarm

When the arrival alarm is enabled, an alarm will be activated when the vessel reaches the waypoint or when it is within the specified arrival radius.

Magnetic variation

Magnetic variation is the difference between true bearings and magnetic bearings, caused by different location of the Geographic and the Magnetic north poles. Any local anomalies such as iron deposits might also affect the magnetic bearings.

Magnetic variation is applied in order to navigate with heading in "True" mode.

When set to Auto, the system automatically converts magnetic north to true north. Select manual mode if you need to enter your own local magnetic variation.

Datum

Most paper charts are made in the WGS84 format, which also is used by the NSO-II system.

If your paper charts are in a different format, you can change the datum settings accordingly to match your paper charts.

Coordinate system

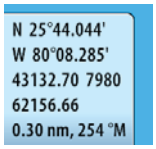
Several coordinate systems can be used to control the format for lat./lon coordinates displayed on the chart panel.

Phantom Loran

Enables use of Phantom Loran.

Loran settings

Defines Loran chains (GRI) and preferred station for waypoint entry, cursor position and position panel.



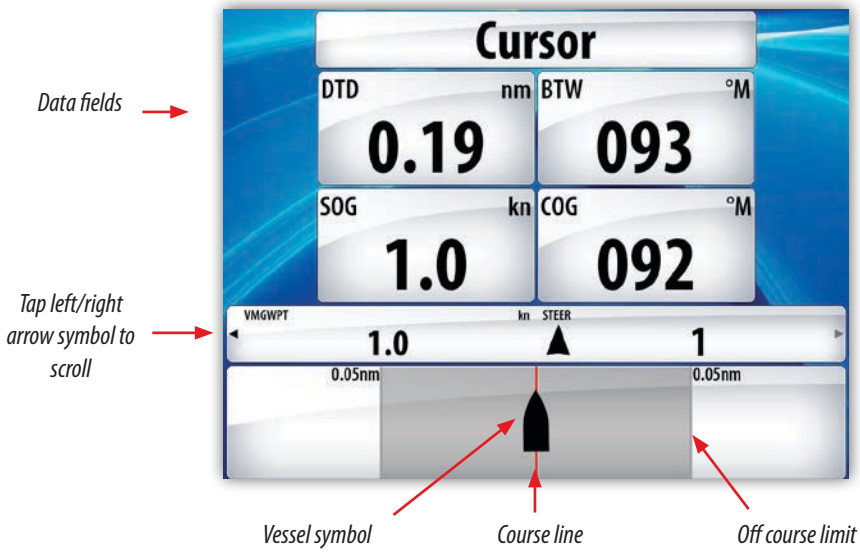
The graphic example shows cursor position window with Loran position information.

For more information refer to your Loran system documentation.

Navigation panels

The Steer and Position panels can be used to display information when you are navigating.

Steer panel



Data fields

The Steer panel offers the following information:

DTD	Distance to destination
BTW	Bearing to waypoint
SOG	Speed over ground
COG	Course over ground
TTD	Time to destination
ETA	Estimated time of arrival at next waypoint
VMG	Velocity Made Good towards next waypoint.
STEER	Course to steer towards next waypoint

Course line

When travelling on a route the course line shows the intended course from one waypoint towards the next.

When navigating towards a waypoint (cursor position, MOB or an entered lat/lon position), the course line will show the intended course from the point at which navigation was started towards the next waypoint.

Vessel symbol

The vessel symbol indicates distance and bearing relative to the intended course.

Off course limit

If the XTE exceeds the defined off course limit (Refer "Steering alarm limits" on page 30), this will be indicated with a red arrow including the distance from the track line.

If the off course alarm is enabled, the alarm will activate if the XTE exceeds the defined off course limit.

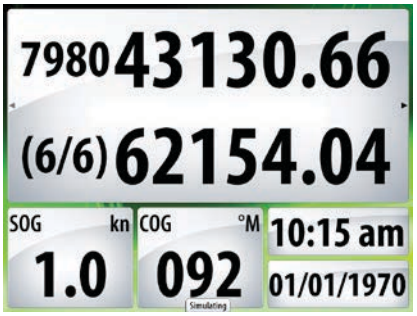
Position panels

By default, there is one position panel available showing GPS position.

If Loran is enabled as described on page 31, there will be two position panels. This is indicated with arrow symbols on left and right side of the panel.

You toggle between the panels by tapping the left or right side of the panel.

GPS position info



Loran position info

Data fields

Position in lat. and lon. (GPS) or as Loran GRI and station values

Time and date

SOG	Speed over ground
COG	Course over ground

6 Autopilot

If an AC12, AC42 or SG05 autopilot computer is connected to the system, autopilot functionality will be available in the NSO-II via OP40 Remote Control.

An Autopilot is designed to maintain an accurate course in various sea conditions with minimal helm movements.

Safe operation with the autopilot

⚠ **Warning:** An autopilot is a useful navigational aid, but DOES NOT under any circumstances replace a human navigator.

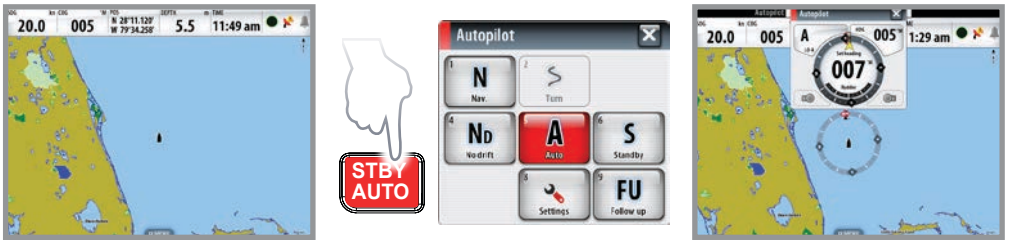
Switching from automatic mode to manual steering

You can switch the autopilot to STBY mode from any automatic operation mode by a short press on the OP40 **STBY/AUTO** key.

→ ***Note:*** If the NSO-II is connected to an EVC system via the SG05, you can take manual control of the steering irrespective of the autopilot mode. Refer "Using the autopilot in an EVC system" on page 43.

Activating the autopilot

You can activate the autopilot from any panel as shown below.



Autopilot pop up

You can only enable the autopilot once the pop-up is displayed.

Manual adjustments to the set heading can only be made when the port and starboard indicators are illuminated red and green - this is done by tapping the autopilot pop-up or pressing the OP40 rotary knob.

The autopilot popup shows active mode, heading, rudder and various steering information depending on active autopilot mode.

The pop-up has a fixed position on the page, and it can be shown on all pages except when an Autopilot panel is active.

You remove the pop-up from a page by tapping the ☒ in the upper right corner or by pressing the OP40 **X** key.

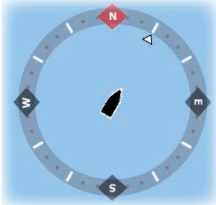
Autopilot mode indication at top of page

Autopilot information is by default shown at the top of the pages when the Autopilot pop-up is not displayed.

You can select to turn this information off via the Auto hide option in the autopilot's settings menu (only in Standby mode).

See "Autopilot settings panel" on page 44 for further information

Compass symbol on the chart panel

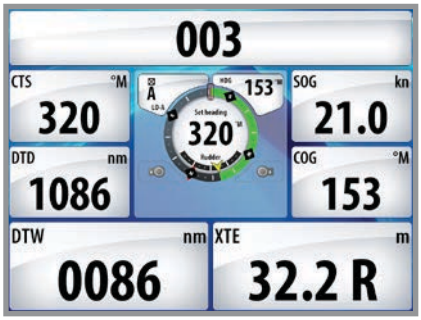


You can select to show a compass symbol around your boat on the chart panel. The compass symbol will be off when the cursor is active on the panel.

Autopilot panel

The autopilot panel is used to display information when you are navigating. It replaces the autopilot pop-up when used in full screen, or on any pages where it is used as a split pane. The autopilot mode indication bar will also not be shown when the autopilot panel is used.

The shortcut icon used to activate the autopilot panel is by default available on the Pages panel. The panel can however only be used when an AC12, AC42 or SG05 computer is available on the network.



Data fields

The autopilot panel shows destination name, heading and rudder information. The following abbreviations are used:

CTS	Course to steer
DTD	Distance to destination
SOG	Speed over ground
COG	Course over ground
DTW	Distance to next waypoint
XTE	Cross track error

Selecting autopilot modes

You select an automatic mode or a feature from the Autopilot Mode selection menu, activated by tapping the mode icon or by pressing the **MENU** key.

Autopilot mode overview

The autopilot has several steering modes. Number of modes and features within the mode depend on boat type and available inputs, as shown in table on the next page.

MODE	FEATURE	BOAT TYPE		DESCRIPTION	REQUIRED INPUT
		MOTOR	SAIL		
S Standby				Standby (passive) mode used when manually steering the boat at the helm	
	Power steering (NFU)	x	x	Controls the rudder movement by using the red (port) and green (starboard) indicators in the autopilot pop-up	Rudder feedback or VRF
FU Follow up		x	x	Sets rudder angle by using the rotary knob	Rudder feedback
A Auto		x	x	Keeps the boat on set heading	Heading, speed
	Heading capture	x	x	Cancels the turn and continues on the heading read from the compass	
	Turn (Pattern)	x		Moves the boat automatically in pre-defined turn steering patterns (Motorboats only)	
	Turn (Tacking)		x	Changes commanded heading with a pre-defined value	
ND No drift		x	x	Keeps the boat on a straight bearing line	Heading, speed, position
	Dodging	x	x	Resumes NoDrift mode after a heading change	
N Nav.		x	x	Steers the boat to a specific waypoint location, or through a route of waypoints	Heading, speed, position, waypoint/route information
W Wind			x	Steers the boat to maintain the set wind angle	Heading, speed, wind angle
	Tacking		x	Mirrors the set wind angle to the opposite side of the bow	
WN Wind Nav.			x	Steers the boat to a specific waypoint location, or through a route of waypoints	Heading, speed, wind angle, waypoint/route information

Controlling steering performance in automatic modes

The autopilot should be configured during installation and setup. Some parameters may be adjusted during operation to increase the steering performance. Refer to "Autopilot settings panel" on page 44.

Using the autopilot in standby mode

The autopilot must be in STBY mode when you steer the boat manually.

You can switch the autopilot to STBY mode from any operation by a short press on the OP40 **STBY/AUTO** key.

Power steering (NFU)

If you tap the PORT or STBD key icons in the pop-up dialog when the autopilot is in STBY mode, the system will switch to NFU (Non-Follow-Up). You can then use the key icons to control the rudder, and the rudder will move as long as the key is pressed.

You return to STBY mode by a short press on the OP40 **STBY/AUTO** key.

Follow-up steering (FU)

You can select Follow-up steering from the Autopilot menu.

When FU is active you can use the rotary knob to set rudder angle. The set angle is indicated by the yellow pointer above the rudder angle graphic. The rudder will move to the commanded angle and then stop.

> ⚠ **Warning:** While in Follow-up mode you cannot take manual control of the wheel. You return to **STBY** mode by a short press on the OP40 **STBY/AUTO** key.

AUTO mode (auto compass)

When the **AUTO** key is pressed, the autopilot selects the current boat heading as the set course. The yellow arrow shows the vessel's actual heading. If the arrow is pointing directly upwards, the vessel is on course.

The autopilot will keep the boat on the set course until a new mode is selected or a new course is set with the OP40 rotary knob or the PORT or STBD key icons.

Once the course is changed to a new set course, the boat will automatically turn to the new heading and maintain the new course.

Heading capture

When in AUTO or NoDrift mode the heading capture feature allows you to automatically cancel the turn you are in by an instant press on the OP40 rotary knob. The autopilot will cancel the turn to continue on the heading read from the compass the very moment you pressed the OP40 rotary knob. This is a useful feature if you are not sure of the exact turn you have to make to steer towards e.g. an inlet or a dock.

Turn pattern steering (power boats)

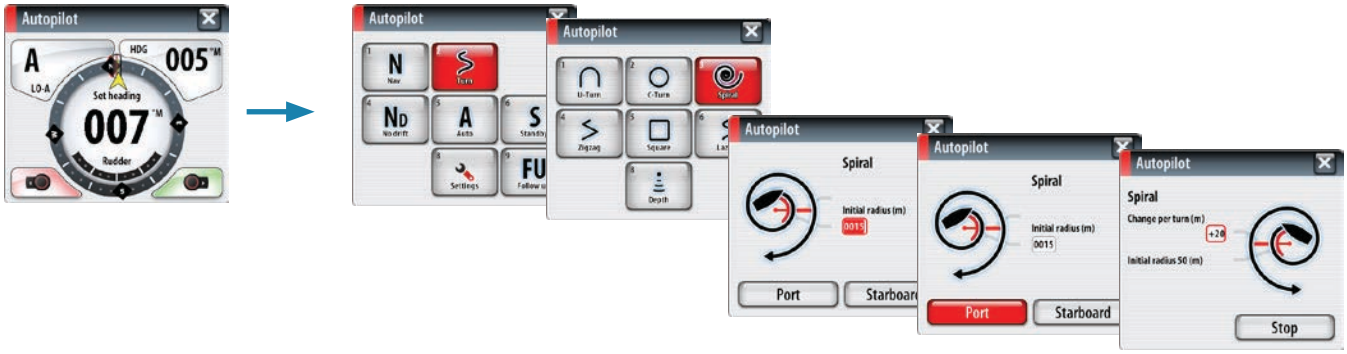
The autopilot includes a number of automatic turn steering features for power boats when the pilot is in AUTO mode.

The turn steering option will not be available if the boat type is set to sailboat - instead the tack/gybe feature is implemented.

Initiating a turn

The illustration below shows how you start the spiral turn steering from the Autopilot menu.

You select the turn direction and start the turn by tapping the left or right keys or by using the OP40 rotary knob.



Stopping the turn

You can at any time during a turn press the OP40 **STBD/AUTO** key to return to standby mode and manual steering.

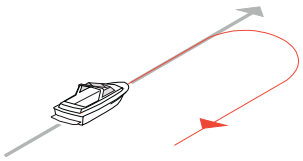
Turn variables

All turn steering options, except the C-turn, have settings that you may adjust before you start a turn and at any time when the boat is in a turn. Refer to the example above.

U turn

U-Turn changes the current set course to be 180° in the opposite direction.

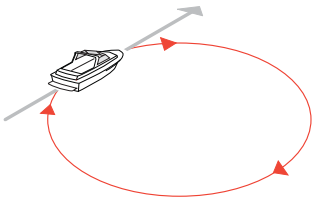
The turn rate is identical to default rate of turn (ROT) setting. This cannot be changed during the turn.



C-turn

C-turn makes the boat turn in a circle.

You can adjust the turn rate (ROT) before the turn is initiated and during the turn. Increasing the turn rate makes the boat turn a smaller circle.



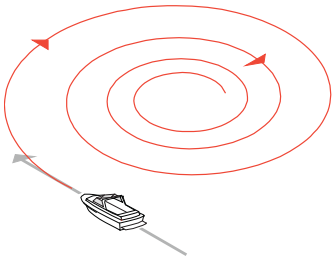
Turn parameter	Range	Change per step	Default	Units
Rate of turn (ROT)	10 - 600	5	90	°/min

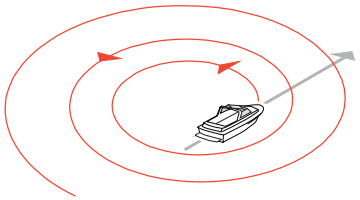
Spiral-turn

Spiral-turn makes the boat turn in a spiral with a decreasing or increasing radius. This feature may be used for circling fish or when searching an object.

If the Change radius is set to zero, the boat will turn in a circle. Negative values indicate decreasing radius while positive values indicate increasing radius.

Turn parameter	Range	Change per step	Default
Initial radius	33 ft - 3281 ft 10 m - 1000 m	10 10	656 ft 200 m
Change of radius per turn	-164 ft - +164 ft -50 m - +50 m	5 2	66 ft 20 m





Zigzag-turns

For navigating in a zigzag pattern, you set the initial course change before the turn is started.

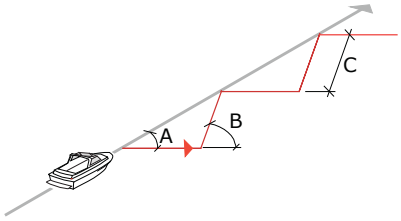
During the turn you can alter the course change and the leg distance.

The main course can be changed by turning the rotary knob.

A = Initial course change

B = Course change

C = Leg distance

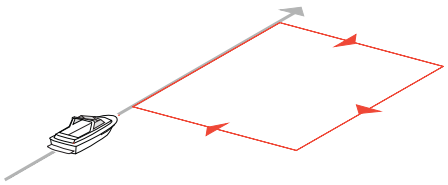


Turn parameter	Range	Change per step	Default
	4° - 140°	4	28°
Leg distance	82 ft - 9843 ft 25 m - 3000 m	50 25	1641 ft 500 m

Square-turn

The square-turn feature makes the boat automatically turn 90° after having travelled a defined leg distance.

You can at any time during the turn change the distance of the leg until the boat makes a new 90° turn. You can also at any time change the main course by turning the rotary knob.



Turn parameter	Range	Change per step	Default
Leg distance	82 ft - 9843 ft 25 m - 3000 m	50 25	1641 ft 500 m

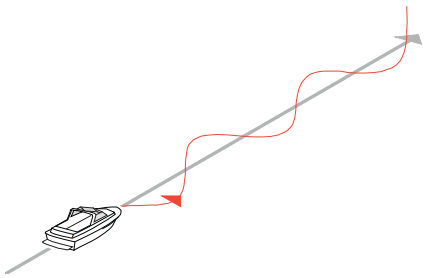
Lazy S-turn

In the lazy-s turn the boat will yaw around the main course.

You set the selected course change before the turn is started.

During the turn you can alter the course change and the turn radius.

The main course can be changed by turning the OP40 rotary knob.

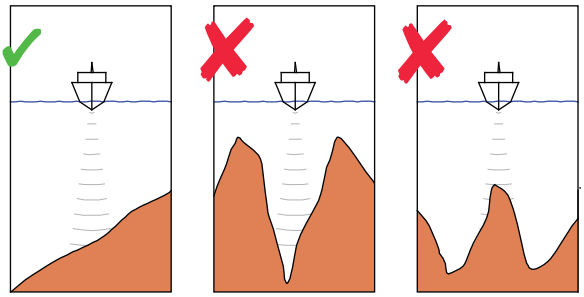


Turn parameter	Range	Change per step	Default
Course change	4° - 160°	4	28°
Radius	16 ft - 1641 ft 5 m – 500 m	5 10	656 ft 200 m

Depth Contour Tracking, DCT *TM*

If the system has input from an echosounder, the autopilot can be set to follow a depth contour.

> ⚠ **Warning:** Do not use this feature unless the seabed is suitable. Do not use it in rocky waters where the depth is varying significantly over a small area.



Slope *Narrow channel* *Ridge*

Use the following process to initiate DCT steering;

1. Ensure that you have depth reading on the NSO-II unit or on a separate depth instrument
2. Steer the boat to the depth you want to track, and in the direction of the depth contour (main course)
3. Activate AUTO mode, select DCT steering and monitor the depth reading
4. Use the port and starboard indicators in the autopilot pop-up to initiate the DCT steering to follow the bottom sloping to starboard or to port

The following parameters are available for DCT steering:

Turn parameter	Range	Change per step	Default
Depth gain	5 - 95	5	5
Contour Cross Angle	0° - 50°	1	0

Depth gain

This parameter determines the ratio between commanded rudder and the deviation from the selected depth contour. The higher depth gain value the more rudder is applied.

If the value is too small it will take a long time to compensate for drifting off the set depth contour, and the autopilot will fail to keep the boat on the selected depth.

If the value is set too high the overshoot will increase and the steering will be unstable.

Contour Cross Angle (CCA)

The CCA is an angle that is added to or subtracted from the set course.

With this parameter you can make the boat yaw around the reference depth with lazy-s movements.

The larger the CCA the bigger yawing will be allowed. If you the CCA set to zero there is no S-ing.

NoDrift mode

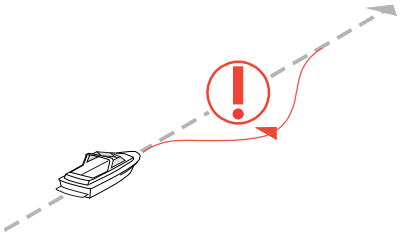
This mode combines the autopilot and the positioning information from the GPS.

When NoDrift is activated, the autopilot will draw an invisible bearing line based on current heading from the boat's position.

Unlike in AUTO (compass) mode the autopilot will now use the position information to calculate the cross track error, and automatically keep your track straight.

You can use the port and starboard indicators in the autopilot pop-up or the rotary knob to reset the bearing line while in NoDrift mode.

Dodging



If you need to avoid an obstacle when using NoDrift mode, you can press STBY and power steer or use the helm until the obstacle is passed.

If you return to NoDrift mode within 60 seconds you can select to continue on previous set bearing line.

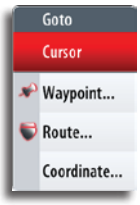
If you don't respond the dialog will disappear and the autopilot will go to NoDrift mode with current heading as set bearing line.

If your dodging maneuver takes more than 60 seconds, the autopilot will remain in Standby mode.

Navigating with the NSO-II

You can use the autopilot feature to automatically steer the boat to a specific waypoint location, or through a route of waypoints. The position information received from the GPS will be used to change the course to steer to keep the boat on the track line and direct to the destination waypoint.

To obtain satisfactory navigation steering, the NSO-II must have valid position input. Autosteering must be tested and determined satisfactory prior to entering the NAV mode:



You can start navigation from any panel by pressing the OP40 **GO TO** key. The goto cursor option will only be available when the cursor is active on a Chart, Radar or Echosounder panel. For more information about navigating with the NSO-II refer to page 29.

You can also start navigating from the autopilot menu.

When the Navigation mode is initiated, the pilot will automatically keep the vessel on the leg. When your vessel reaches the arrival circle for a waypoint, the pilot will give an audible warning and display an alert screen with the new course information.

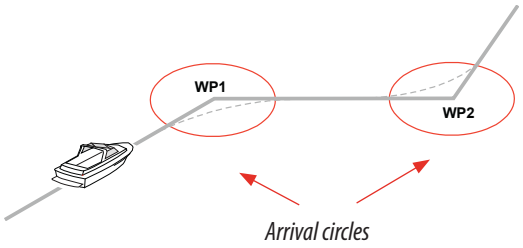
If the required course change to the next waypoint is less than the Navigation change limit, the autopilot will automatically change the course. If the required course change to next waypoint in a route is more than the set limit, you are prompted to verify that the upcoming course change is acceptable.

→ ***Note:*** For more information about navigation parameters and how to navigate with the NSO-II, refer to page 29.

> ⚠ **Warning:** Navigational steering should only be used in open waters. When selecting NAV mode, the pilot maintains the current set course and prompts the user to accept the course change towards the destination waypoint.

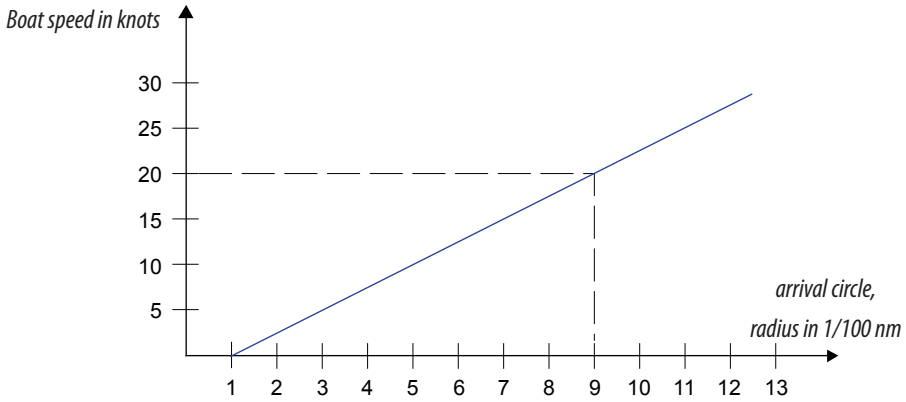
Waypoint arrival circle

The Arrival radius defines the point at which a turn is initiated when you are navigating a route.



The arrival circle should be adjusted according to boat speed. The higher the speed, the wider the circle. The intention is to make the autopilot start the heading change in due time to make a smooth turn onto the next leg.

The figure below may be used to select the appropriate waypoint circle when creating the route.



Example: With the speed of 20 knots you should use a waypoint circle with radius 0.09 nm.

→ ***Note:*** The distance between any waypoints in a route must not be smaller than the radius of the waypoint arrival circle when using automatic waypoint shift.

Sailing with the autopilot

Several sailing parameter should be defined before entering Wind or WindNav mode. These parameters are described in the separate installation manual.

Wind vane steering

The WIND mode is only available if the system has been set up for sailboat in the Autopilot Installation menu.

Before the WIND mode is started it must be verified that valid input from wind transducer is available.

Initiate wind steering as follows;

1. Switch the Autopilot to AUTO mode
2. Adjust the boat heading until wind angle is according to the angle you want to maintain
3. Press the OP40 **MENU** key, and select Wind

The set course to steer (CTS) and set wind angle are entered from the compass heading and the wind transducer at the moment the WIND mode is selected. From that point the autopilot will change the course to maintain the wind angle as the wind direction may change.

Tacking

➔ ***Note:*** The tack function is only available when the system is set up for SAIL boat type.

Tacking should only be performed into the wind and must be tried out in calm sea conditions with light wind to find out how it works on your boat. Due to a wide range of boat characteristics (from cruising to racing boats) the performance of the tack function may vary from boat to boat.

You can initiate the tack function both from AUTO and from WIND mode.

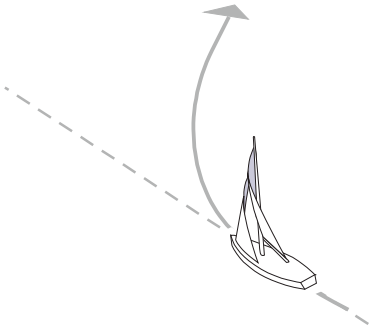
In both modes you can interrupt the tack operation, as long as the tack dialog is open, by selecting the opposite tacking direction. When interrupted the boat will return to the previous set heading.

Tacking in Auto mode

Tacking in AUTO mode is different from tacking in WIND mode. In AUTO mode the tack angle is fixed and as defined by the user.

When tacking direction is selected the autopilot changes the current set course according to the set fixed tacking angle.

See "Sailing parameters" on page 45 for further information.



Tacking in Wind mode

Tacking in WIND mode as compared to AUTO mode can be performed when sailing with apparent or true wind as the reference. The true wind angle should be less than 90 degrees.

The rate of turn during the tack will be given by the Tack time defined in the sailing parameter setup (refer illustration above). The tack time is also controlled by the speed of the boat to prevent loss of speed during a tack.

When you initiate the tacking, the autopilot will immediately mirror the set wind angle to the opposite side of the bow.

Gybing

Gybing is possible when the true wind angle is larger than 120°.

The time to make a gybe is determined by the speed of the boat to make it as quick as possible within control.

Tack and gybe prevent

You should use the autopilot with care when beating and running.

If the sails are unbalanced when beating, yaw forces from the sails can drive the boat into the wind. If the boat is driven beyond the set minimum wind angle, the thrust from the sails will suddenly disappear and reduces the boat speed. The boat will then be more difficult to steer as the rudder will become less effective.

The tack prevent function in WIND mode has been implemented to avoid such situations. It will react immediately when the apparent wind angle becomes 5° less than the set minimum wind angle, and more rudder will be commanded.

When running, it is difficult to steer the boat with waves coming sideways or from behind.

The waves may yaw the boat into an unwanted gybe; this can be hazardous for both the crew and the mast.

The gybe prevent function will be activated when the actual apparent wind angle becomes greater than 175° or gets opposite to the set wind angle. More rudder will be commanded to prevent an unwanted gybe.

The tack and gybe prevent functions are not a guarantee against getting into a hazardous situation. If the effect of the rudder and/or drive unit is not adequate, a dangerous situation may occur. Pay particular attention in such situations.

Wind steering and navigation

In Wind Nav the autopilot steers the boat given both wind data and track data from the NSO-II navigation function.

In Wind Nav mode the autopilot calculates the initial course change needed to navigate towards the active waypoint, but the pilot will also utilize the current wind direction in the calculation.

Using the NSO-II in an AP24/AP28 system

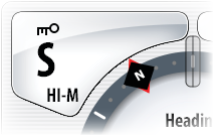
Command transfer

If your NSO-II unit is connected to an autopilot system including an AP24 or AP28 control unit, only one control unit can be active at the same time. An inactive unit is indicated with an envelope symbol in the display.

You can take command from an inactive NSO-II unit with active autopilot pop-up by turning or pressing the OP40 rotary knob.

If the pop-up is not displayed, you can take command from the NSO-II unit by pressing and holding the OP40 **STBD/AUTO** key to bring up the mode selection menu, and then confirming active mode.

Locking remote stations



The AP24/AP28 includes a Remote Lock function that will disable all other control units. A locked unit is indicated with a key symbol.

When the remote lock function is enabled on AP24/AP28 no transfer of command to NSO-II or other AP heads on the system can take place, only the active AP control unit stays in command.

You can only unlock the remote stations from the AP24/AP28 unit in command.

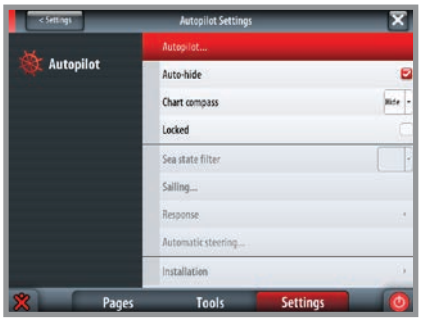
Using the autopilot in an EVC system

When the NSO-II is connected to an EVC system via the SG05, you can take manual control of the steering irrespective of the autopilot mode.

The mode indicator on the pilot pop-up will be replaced by a dash to indicate EVC override.

The system will return to NSO-II control in standby mode if no rudder command is given from the EVC system within a predefined period.

Autopilot settings panel



The Autopilot settings panel gives access to settings that might be changed by the user during operation of the autopilot.

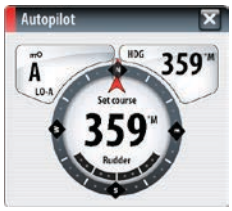
For information about installation, see the separate NSO-II Installation manual.

Auto-hide

Autopilot information is by default shown on top of the pages when the Autopilot pop-up is not displayed. You can select to turn this information off.

Chart compass

You can select to show a compass symbol around your boat on the chart panel. The compass symbol will be off when the cursor is active on the panel.



Locking an NSO-II unit

If two NSO-II units are included in the system, the non-active NSO-II unit can be locked to prevent unauthorized operation of the autopilot.

When the unit is locked this is indicated with a lock symbol and with text in the pop up.

When the lock function is in use, no automatic modes can be selected from the NSO-II unit.

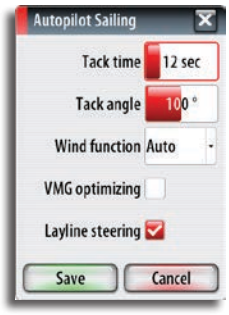
→ ***Note:*** The lock function is not available on the NSO-II unit which is active as pilot control! If the NSO-II unit is part of an AP24/AP28 system, the unit can be locked from the AP24/AP28 control unit.

Sea state filter

The Seastate filter is used to reduce rudder activity and autopilot sensitivity in rough weather.

OFF	Seastate filter is disabled. This is default
AUTO	Reduces rudder activity and autopilot sensitivity in rough weather by an adaptive process. The AUTO setting is recommended if you want to use the seastate filter
MANUAL	Linked to the steering response control settings described previously. It may be used to manually find the optimum combination of course keeping and low rudder activity in rough but steady sea conditions

Sailing parameters



→ *Note:* Sailing parameter settings are only available if the boat type is set to Sail.

Tack time

When performing a tack in WIND mode, the rate of turn (tack time) can be adjusted. This will give single-handed sailors time to handle the boat and the sails during a tack.

A turn performed without shifting wind side, will also be made at a controlled turn rate.

Range	Change per step	Default	Units
2 - 50	1	12	seconds

Tack angle

This value is used to preset the course change used when tacking in AUTO mode. By pressing the port and starboard indicators in the autopilot pop-up the course will change as much as this value.

Range	Change per step	Default	Units
50 - 150	1	100	°

Wind function

With wind function set to **AUTO**, the autopilot will automatically select between apparent and true wind steering. **AUTO** is default and recommended for cruising.

When the boat is running, it will also be surfing on the waves. This may lead to significant changes in boat speed, and thereby also changes in apparent wind angle. True wind steering is therefore used when running, while steering to apparent wind is used when beating or reaching.

Apparent wind steering is preferred when you want to achieve maximum boat speed. The autopilot tries to maintain a constant apparent wind angle to get maximum thrust from a given trim of the sails.

When sailing in closed waters, the apparent wind angle may change temporarily due to wind gusts. It may then be preferred to sail to the true wind.

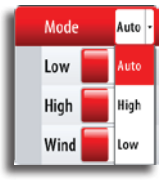
VMG optimizing

You can optimize the VMG to wind. When selected, the function will be active for 5–10 minutes after a new wind angle has been set and only when beating.

Layline steering

Layline steering is useful when navigating. Cross Track Error (XTE) from the navigator will keep the boat on the track line. If the XTE from the navigator exceeds 0.15 nm, the autopilot will calculate the layline and track towards the waypoint.

Response



By default the system switches between HI/LO parameter set based on speed (motor boats) or speed and wind (sail boats). You can however select to manually set which parameter set that shall be used.

HI or LO must be selected if no speed input is available.

You can manually fine tune each of the two (HI/LO) parameter sets. Level 4 is default with parameter values as set by the autotune function. If no autotune is made (not recommended) the level 4 values are the factory default values.

A low response level reduces the rudder activity and provides a more "loose" steering.

A high response level increases the rudder activity and provides a more "tight" steering. A too high response level will make the boat start S-ing.

Automatic steering

This option displays an overview of all autopilot steering parameters, and you can adjust parameters if required.

For more details, refer to the separate AC12/AC42 Installation manual.

Installation

Used for autopilot installation and commissioning. See the separate AC12/AC42 or SC05 Installation manual.

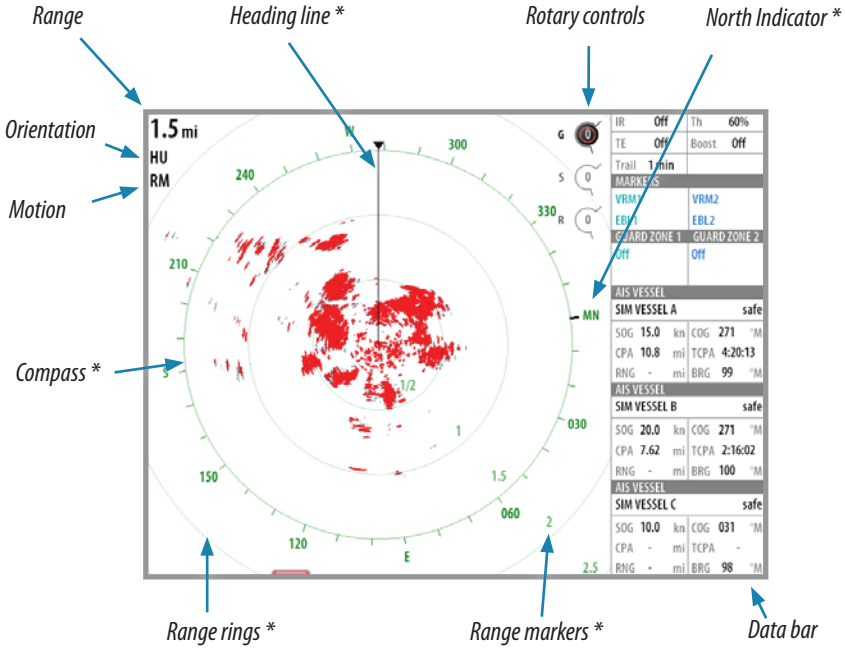
7 Radar

The radar panel can be set up as a full screen view or combined with other panels.

The radar image can also be displayed as an overlay to existing 2D and 3D chart views. Refer to "Charts" on page 17.

➔ ***Note:*** Radar overlay requires data from heading sensor.

Radar panel



* Optional radar symbology.

Radar symbology can be turned ON/OFF collectively from the Radar menu, or individually as described in "Radar settings panel" on page 54.

Radar operational modes

The radar's operational modes are controlled from the NSO-II unit. The following modes are available:

Off

The power to the radar scanner is turned off

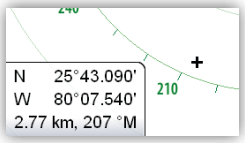
Standby

The power to the radar scanner is on, but the radar is not transmitting.

Transmit

The scanner is on and transmitting. Detected targets will be drawn on the radar PPI (Plan Position Indicator).

Using the cursor on the radar panel



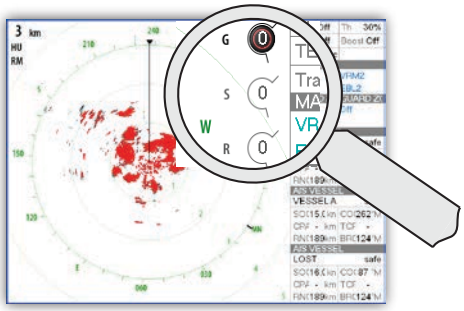
The cursor is by default not shown on the radar image.

When you tap the radar panel the cursor and the cursor position window will be activated.

The cursor can be used to measure a distance to a target, and to select targets as described later in this section.

To remove the cursor and cursor elements from the panel, tap the **Clear cursor** panel button or the OP40 **X** key.

Optimizing the radar image



You may be able to improve the radar image by adjusting the radar sensitivity, and by filtering out the random echoes from sea and weather conditions.

You select between the control images by tapping the image or by pressing the OP40 rotary knob. Active control will expand and display its name in full. You can then adjust the value by turning the OP40 knob or by a vertical dragging movement on the control you want to adjust.

Gain

The gain controls the sensitivity of the radar receiver.

A higher gain makes the radar more sensitive to radar returns, allowing it to display weaker targets. If the gain is set too high, the image might be cluttered with background noise.

Gain has a manual and an automatic mode. You cycle through the modes by pressing and holding the OP40 rotary knob. You can only adjust the gain value in manual mode by turning the OP40 rotary knob or a vertical dragging movement over the gain control.

Sea clutter

Sea clutter is used to filter the effect of random echo returns from waves or rough water near the vessel.

When you increase Sea Clutter filtering the on-screen clutter caused by the echoes of waves will be reduced.

A long-press on the OP40 rotary knob will cycle through available Sea clutter modes. You can only adjust the sea clutter value in manual mode by turning the OP40 rotary knob or a vertical dragging movement over the sea clutter control.

Rain Clutter

The Rain clutter is used to reduce the effect of rain, snow or other weather conditions on the radar image.

Adjust value by turning the OP40 rotary knob or a vertical dragging movement over the rain clutter control.

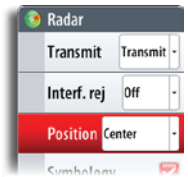
The value should not be increased too much as this may filter out real targets.

Rejecting radar interference

Interference could be caused by radar signals from other radar units operating in the same frequency band.

A high setting will reduce the interference from other radars.

In order to not miss weak targets, the interference rejection should be set low when no interference exists.



Positioning the radar center

You can move the radar PPI center to different positions within the radar panel, and select how your vessel symbol moves on the radar image.

Radar motion is indicated on the upper left corner of the radar panel as either TM (True motion) or RM (Relative motion).

The radar position can only be changed when the radar is transmitting.

Center

Default setting. The radar PPI center is centered on the radar panel.

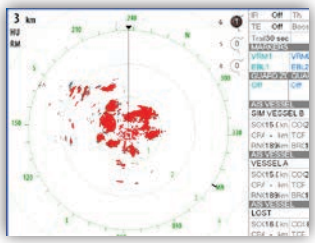
Look Ahead

Moves the radar PPI center to the bottom of the panel to give maximum view ahead.

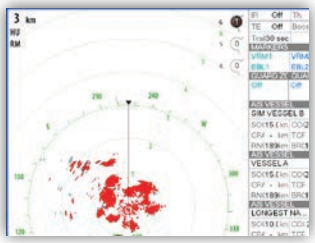
Offset

Allows you to move the PPI center to any location on the radar panel.

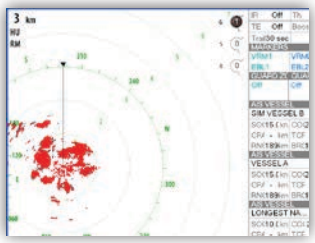
1. Select the offset option from the menu
2. Tap the screen where you want to position the radar center
3. Confirm the setting by tapping the **SAVE OFFSET** key at the top of the screen or by pressing the OP40 **MENU** key.



Center



Look ahead



Custom offset

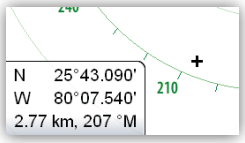
True motion

In True motion your vessel, and moving targets, move across the Radar screen as you travel. All stationary objects remain in a fixed position. When the vessel's symbol reaches the edge of the screen, the radar image will be redrawn with the vessel symbol re-positioned in center of the screen.

When True motion is selected, the menu will expand to include a reset true motion option. This allows for manually resetting the radar image and vessel symbol to screen center.

Measuring range and bearing to a target

Using the cursor



The cursor is by default not shown on the radar image.

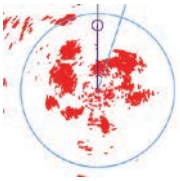
When you tap the radar panel the cursor will be visible, and the cursor position window will be activated, showing range and bearing from your vessel to cursor position.

Range rings

The range rings are displayed at preset distances from the vessel based on the radar range.

You can use the range ring to estimate the distance to a radar echo.

EBL/VRM

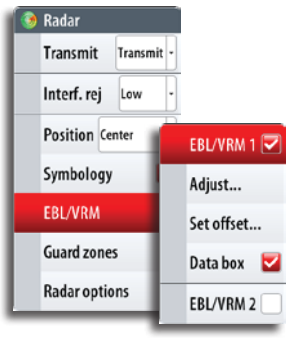


The electronic bearing line (EBL) and variable range marker (VRM) allows quick measurements of range and bearing to vessels and landmasses within radar range. Two different EBL/VRMs can be placed on the radar image.

The EBL/VRM is by default positioned from the center of the vessel. It is however possible to offset the reference point to any selected position on the radar image.

You can position EBL/VRM by using the cursor, and edit the marker position as described below.

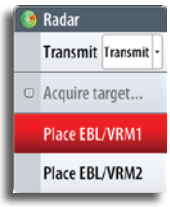
When positioned, you can quickly turn the EBL/VRM on/off by tapping the relevant markers on the data bar.



Defining an EBL/VRM marker

1. Ensure that the cursor is not active on the radar panel
2. Activate the menu
3. Select one of the EBL/VRM markers
4. Select adjustment method, and tap the screen to adjust the marker
5. Tap the panel key to save the marker position

When positioned, you can quickly turn the EBL/VRM on/off by tapping the relevant section on the data bar.



Quick EBL/VRM marker positioning by using the cursor

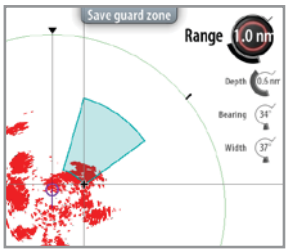
1. Tap the radar panel to position the cursor
2. Activate the menu
3. Select one of the EBL/VRM markers
   - The EBL line and the VRM circle will be positioned according to the cursor position
4. If required, tap the panel to reposition the marker
5. Press **Save EBL/VRM** panel key or activate the menu to save the position

Setting a guard zone around your vessel

A guard zone is an area (either circular or a sector) that you can define on the radar image. When activated, an alarm will alert you when a radar target enters or exits the zone.

Defining a guard zone

1. Activate the menu
2. Select one of the guard zones
3. Select shape
4. Select **Adjust** to position the zone, and tap and drag on the screen or use the OP40 rotary knob to adjust range, depth, bearing and width
5. Save the position by tapping the panel key or by activating the menu



When positioned, you can quickly turn the guard zones on/off by tapping the relevant section on the data bar.

Alarm settings

An alarm will be activated when a radar target breaches the guard zone limits. You can select if the alarm will be activated when the target enters or exits the zone.

Sensitivity

The guard zone sensitivity can be adjusted to eliminate alarms for small targets.

Radar options

The radar threshold

The threshold sets required signal strength for the lowest radar signals. Radar returns below this limit will be filtered and not displayed.

Default value: 30%.

Target boost

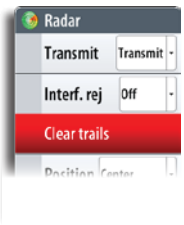
The target boost option is used for increasing the size of radar targets.

Target expansion

Target expansion will override and increase the default radar pulse length, providing larger target returns.

Target trails

You can define how long time the trail that each target leaves should remain on your radar panel. You can also turn OFF target trails.



→ ***Note:*** True motion is recommended when using Target trails

Clearing target trails from the panel

When target trails are displayed on the panel, the radar menu will be expanded to include an option where you can clear target trails from your radar panel temporarily. The target trails will start to appear again unless you switch them off as described above.

The radar palette

Different colors (palettes) can be used to represent detail on your radar panel.

Radar orientation

Radar orientation is indicated on the upper left corner of the radar panel as either HU (Heading UP), NU (North Up) or CU (Course up).

Heading up

Rotates the radar image to display the current heading directly up on the radar image.

North up

Rotates the radar image with the north direction upwards.

Course up

Rotates the radar image to display the current navigation course directly up.

This option works only when the NSO-II is navigating an active route. If you are not navigating an active route the heading up orientation will be used until the navigation function is started.

Fast scan

(Broadband Radar™ only).

Increases the speed of the radar scanner when the range is set to 2 nm or less. This option gives faster updates on target movements within this range.

STC curve

(Broadband Radar™ only).

The STC (Sensitivity Time Control) controls the sensitivity of the radar signal close to your vessel. Your selection should be based on the current sea conditions.

MARPA targets

If the NSO-II includes a heading sensor, the MARPA function (Mini Automatic Radar Plotting Aid) can be used to track up to tem radar targets.

You can define alarms to notify you if a target gets too close. Refer "MARPA target settings" on page 52.

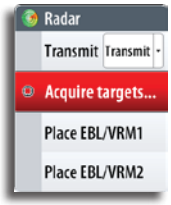
MARPA tracking is an important tool for collision avoidance.

→ ***Note:*** MARPA requires heading data for both the radar and the NSO-II .

MARPA target symbols

The NSO-II system use the target symbols shown below.

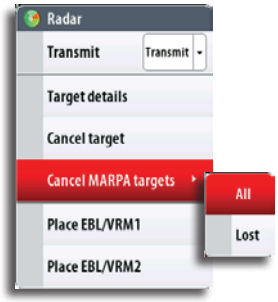
Symbol	Description
	Acquiring MARPA target. Typically it takes up to 10 full rotations of the scanner
	Tracking MARPA target, not moving or at anchor.
	Tracking and safe MARPA target with extension lines.
	Dangerous MARPA target. A target is defined as dangerous based on the CPA, TCPA and AIS Range settings. Refer "Vessel alarm settings" on page 53.
	When no signals have been received within a time limit a target will be defined as lost. The target symbol represents the last valid position of the target before the reception of data was lost.
	Selected MARPA target, activated by tapping on the target icon. The target will return to default target symbol when the cursor is removed.



Tracking MARPA targets

1. Tap on the target on the radar panel
2. Select **Acquire targets** from the menu
3. Repeat process for more targets

Once your targets are identified, it may take up to 10 radar sweeps to acquire and then track the target.



Cancelling target tracking

When targets are being tracked, the radar menu will expand to include options for cancelling individual targets or to stop the tracking function.

Cancel tracking individual targets by tapping the icon before activating the menu.

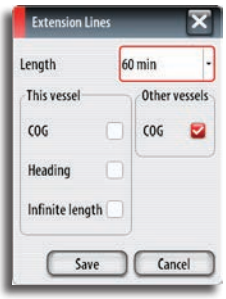
Viewing target information

Basic target information can be shown in the data bar.

You can also use the Vessels window under Tools pages to view information about targets.

MARPA target settings

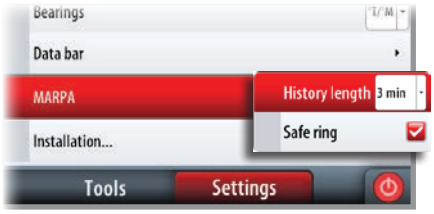
Several vessel settings define alarm limits and how the targets are displayed on your radar image.



Target trails and safe rings

You can define the length of the MARPA trail making it easier to follow target movement.

A circle can be added around the MARPA target to present the danger zone. Refer "Defining dangerous vessels" on page 53.



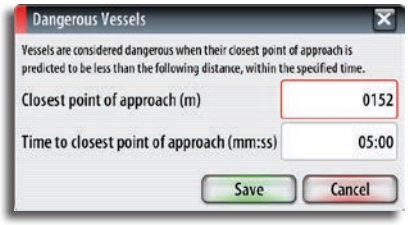
Vessels extension lines

Sets the length of the extension lines for your vessel and for other vessels.

The length of the extension lines is either set as a fixed distance, or to indicate the distance the vessel will move in the selected time period.

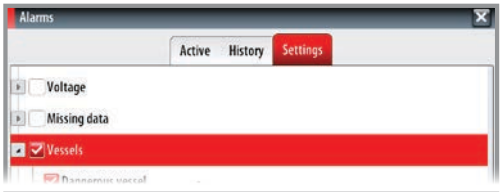
Defining dangerous vessels

You can define dangerous vessels based upon CPA (Closest Point of Approach) or TCPA (Time to Closest Point of Approach). When your vessel comes within this distance from a vessel, the symbol will change to the "dangerous" target symbol. An alarm will be triggered if activated in the Alarm settings panel.


Dangerous Vessels
Vessels are considered dangerous when their closest point of approach is predicted to be less than the following distance, within the specified time.
Closest point of approach (m)
0152
Time to closest point of approach (mm:ss)
05:00
Save
Cancel

Vessel alarm settings

You can define several Vessels alarms to alert you if a target comes within predefined range limits, or if a previously identified target is lost.



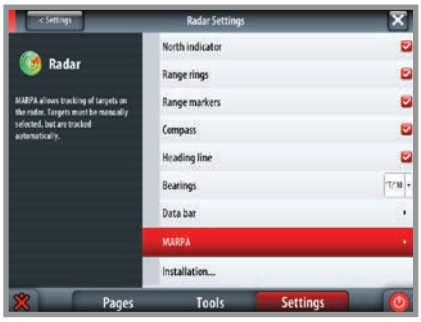
Alarm ID	Description
Dangerous vessel	Controls whether an alarm shall be activated when a vessel comes within the predefined CPA or TCPA. See ***Defining dangerous vessels*** above. → ***Note:*** The check box controls whether the alarm pop-up box is displayed and if the siren will sound. The CPA and TCPA defines when a vessel is dangerous regardless of the enabled/disabled state.
MARPA target lost	Controls whether an alarm shall be activated when a MARPA target is lost
MARPA unavailable	Controls whether an alarm shall be activated if you do not have the required inputs for MARPA to work (valid GPS position and heading sensor connected to the radar server)

Radar overlay

You can overlay the Radar image on the Chart. This can help you to easily interpret the radar image by correlating the radar targets with charted objects.

When the radar overlay is selected, basic radar operational functions are available from the Chart panel's menu.

Radar settings panel



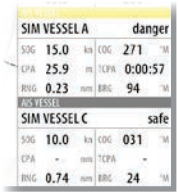
Radar symbology

You can turn on/off optional radar symbology individually from the Radar settings page. See illustration showing optional radar items on page 47.

Data bar

Turns on/off the radar data bar. Refer illustration on page 47.

The data bar can show up to 3 targets, arranged with the closest target on top. You can select to show MARPA targets on top and before any AIS targets, even if the AIS targets are closer to your vessel.



MARPA settings

Allows for adding target trails and guard zone indication around a MARPA target. Refer to description on previous pages.

Installation

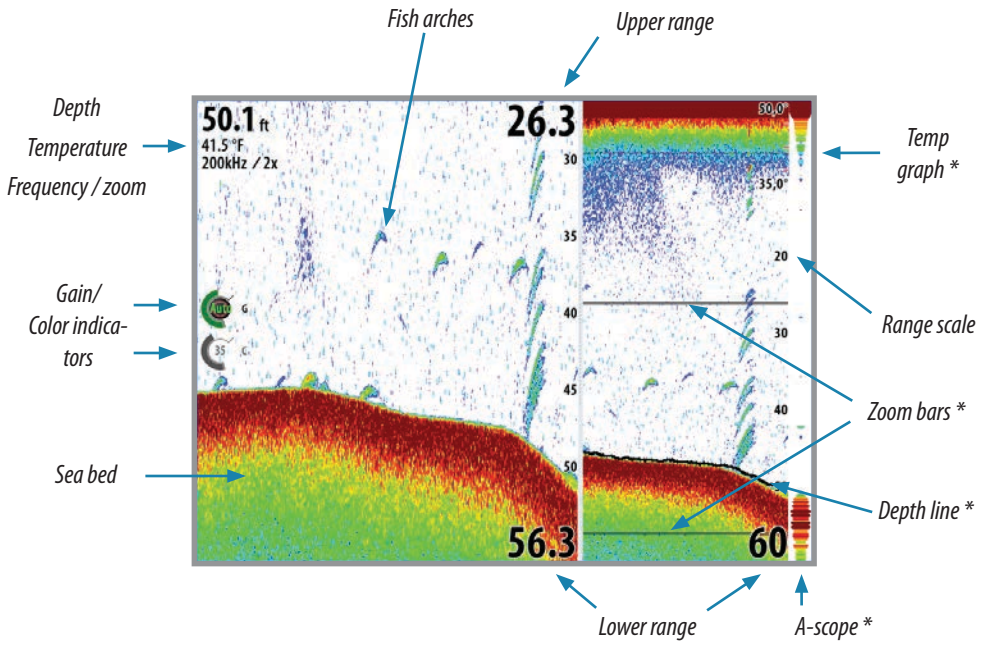
The Installation option is used for Radar installation, described in the separate NSO-II Installation manual.

8 Echosounder

The echosounder function provides a view of the water and bottom beneath your vessel, allowing you to detect fish and examine the structure of the sea floor.

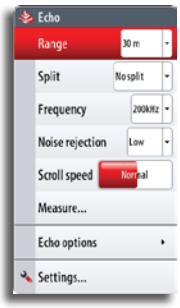
The echosounder displays the water column moving from right to left on the panel.

You can select between single panel view and several split views as described later in this chapter.



* Optional echosounder image items

→ *Note:* You turn the optional echosounder images on/off individually. See "Echosounder settings panel" on page 60.



Setting up the echosounder panel

The echosounder panel is setup from the panel's main menu.

The range

The range setting determines the water depth that is visible on the screen.

Auto range

If you select Auto, the system will automatically display the whole range from the water surface to the bottom.

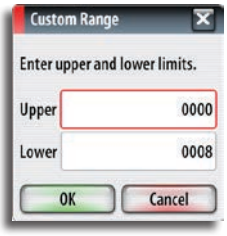
Preset range levels

You can select between several preset range levels.

Custom range

This option allows you to manually set both upper and lower range limits.

The echosounder panel can be setup as a single view, or with split view where the left and the right side presents different images.



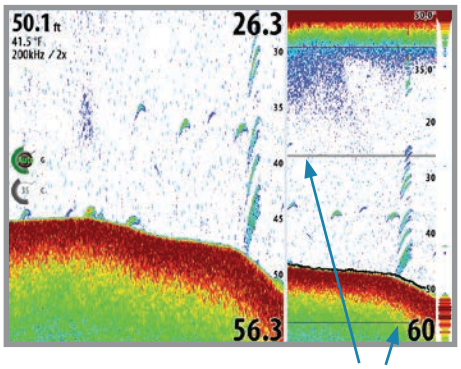
Split screen options

Zoom

The Zoom mode presents a magnified view of the sounder image on the left side of the panel.

By default the zoom level is set to 2x. You can select up to 8x zoom from the drop-down menu.

The range zoom bars on the right side of the display shows the range that is magnified. If you increase the zooming factor the range will be reduced. You will see this as reduced distance between the zoom bars.



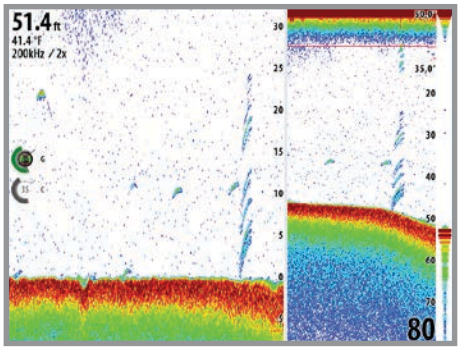
Zoom bars

Bottom lock

The bottom lock mode is useful when you want to view echoes close to the bottom.

In this mode the left side of the panel shows an image where the bottom is flattened. The range scale is changed to measure from the seabed (0) and upwards. The bottom and the zero line will always be shown on the left image, independent on range scale.

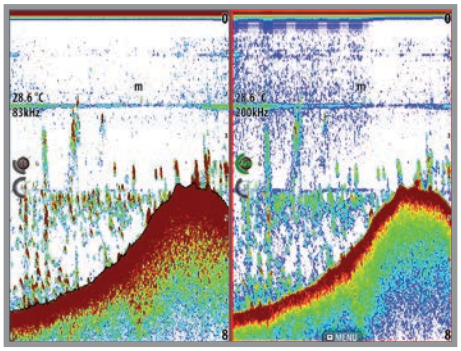
The scaling factor for the image on the left side of the panel is adjusted as described for the Zoom option.



Echo frequency

The NSO-II unit supports several transducer frequencies. Available frequencies depend on sounder module and which transducer model is connected.

You can view two frequencies at the same time by setting up a dual echosounder.



Noise rejection

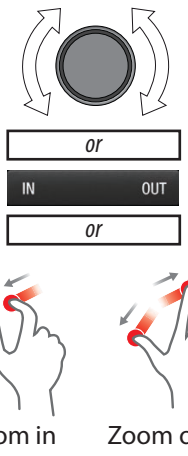
Signal interference from bilge pumps, engine vibration and air bubbles can clutter the image.

The noise rejection option filters the signal interference and reduces the on-screen clutter.

Scroll speed

You can select the scrolling speed of the echosounder image on the screen. A high scroll speed will update the image fast, while a low scroll speed will present a longer history.

Zooming



Zoom in Zoom out

To select zooming level on the Echosounder image, you can use the OP40 rotary knob, or use the **IN/OUT** keys or simply pinch to zoom IN and spread to zoom OUT.

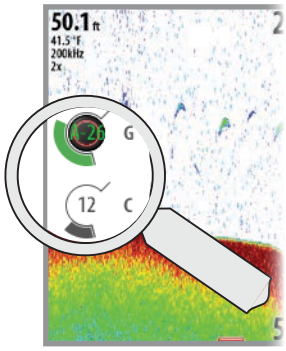
Zoom level is shown on the upper left side of the echosounder the panel.

When zooming in, the sea floor will be kept near to bottom of the screen, irrespective of whether it is in auto-range or manual range.

If the range is set considerably less than the actual depth, the unit will not be able to find the bottom when zooming.

If the cursor is active, the unit will zoom in where the cursor is pointed.

Adjusting color and gain settings



Gain

The gain controls the sensitivity of the echosounder.

The more you increase the gain, the more details will be shown on the image. However, a higher gain setting may introduce more background clutter on the image. Conversely, if the gain is set too low weak echoes may not be displayed.

Auto gain

The Auto gain option will keep the sensitivity at a level that works well under most conditions.

With the gain in auto mode, you can set a positive or negative offset that gets applied to the auto gain. This is indicated as A-40 - A40.

Color

Strong and weak echo signals have different colors to indicate the different signal strengths. The colors used depend on which palette you select.

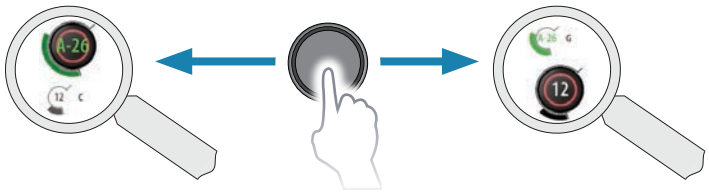
The more you increase the Color setting, the more echoes will be displayed in the color at the strong return end of the scale.

Adjusting the Gain and Color settings

Gain and Color are adjustable by tapping and a vertical dragging movement or by using the OP40 rotary knob.

You select between Gain and Color by pressing the OP40 rotary knob. The active control will expand and display it's name in full. You can then adjust the value by turning the OP40 knob.

If you press and hold the OP40 rotary knob when Gain is selected, you switch between Auto and Manual gain option.



If no adjustments are made within 3 seconds the controls will return to default size.

Using the cursor on the echosounder panel

The cursor is by default not shown on the sounder image.

When you tap the screen the cursor will appear and the depth at the cursor position will be shown, the information window and the history bar will be activated.

To remove the cursor and cursor elements from the panel, press the **Clear cursor** panel key or the OP40 **X** key.

Viewing sounder history

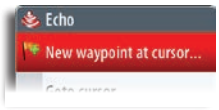
Whenever the cursor is shown on a sounder panel, the red scroll bar is also shown. The scroll bar shows the image you are currently viewing in relation to the total echosounder image history stored.

The scroll bar on the far right side indicates that you are viewing the latest soundings. If you position the cursor to the left side of the screen, the history bar will start scrolling towards left, and the automatic scrolling as new soundings are received will be turned off.

You can pan the image history by dragging left/right on the screen.

To resume normal scrolling, tap the **Clear cursor** panel button or press the OP40 **X** key.

Placing a mark on an echosounder image



You can position a mark at the vessel's position by pressing and holding the OP40 **PLOT/MARK** key.

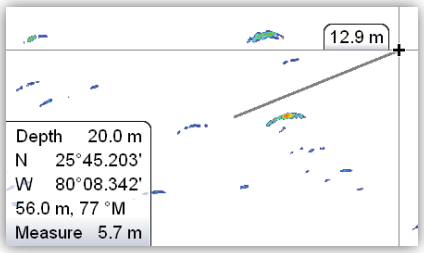
You can position a mark on a selected echosounder item by tapping the screen and then activating the menu.

→ *Note:* Only marks positioned by using the cursor will include depth information.

Measuring distance

The cursor can be used to measure the distance between the position of two observations on the sounder image. It is easier to use the measure function when the sounder image is paused.

1. Activate the menu to start the measure function
   - The cursor will be positioned in the middle of the panel, and the distance will be measured from this position
2. Tap on the screen to select the second measuring point
   - A line will be drawn between the measuring points, and the distance will be listed in the Information window



3. Continue tapping the screen to position new measuring points

When you press the **Finish measuring** panel button or the OP40 **X** key, the echosounder will resume to normal scrolling.

Pausing the echosounder

You can pause the sounder, allowing you to examine the sounder echoes. The function is activated from "Echosounder settings panel", see page 60.

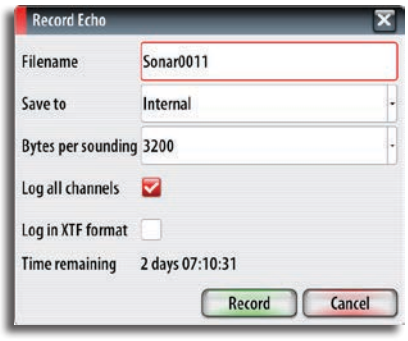
This function is useful when you need to position a waypoint exactly on the echosounder panel, and if you are using the cursor to measure a distance between 2 elements on the image.

Recording echosounder data

You can record echosounder data and save the file internally in the NSO-II unit, or on to an SD card inserted into the unit's card reader located on the processor box.

The function is activated from "Echosounder settings panel", see page 60.

The following options are available:



Bytes per sounding

Select how many bytes per seconds that are to be used when saving the log file. More bytes yield better resolution, but will cause the record file to increase in size compared to using lower byte settings.

Log all channels

Logs all available sonar data simultaneously.

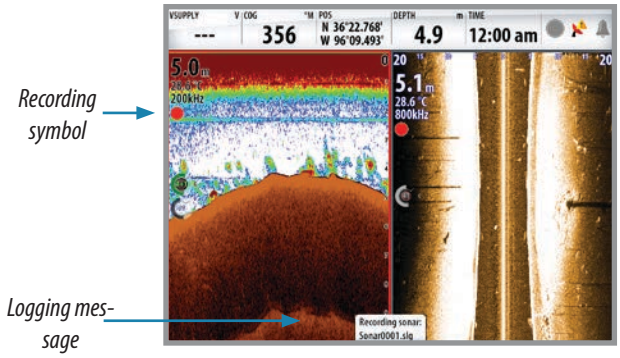
When logging all channels, logs are saved in SL2 format instead of .slg format.

Log in XTF format

Optional logging format for SideScan data. This will only be available when a StructureScan unit is connected.

This format does not log all channels into one file. The format is used for third part application support on the PC (like SonarWiz) that need access to the StructureScan data.

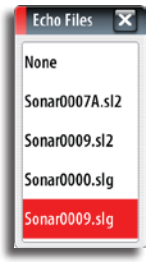
When the echosounder image is being recorded, there will be a flashing red symbol and a message will appear periodically at the bottom of the screen.



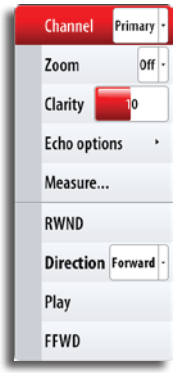
The graphics shows that both conventional echosounder and StructureScan data are being logged

The sounder recording is stopped by re-selecting the Record function.

Viewing the recorded sounder data



Both internally and externally stored sounder records may be reviewed when selected.

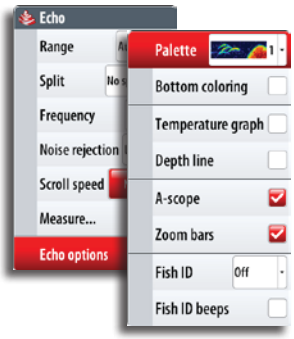


The log file is displayed as a paused image, and you control the scrolling and display from the replay menu.

You can use the cursor on the replay image, and pan the image by tapping and dragging on the screen as on a normal echo image.

If more than one channel was recorded in the selected echo file, you can select which channel to display.

You exit the replay mode by pressing the OP40 **X** key or the ☒ symbol in the upper right corner.



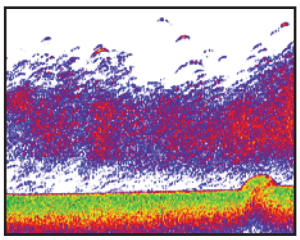
Echo options

Palettes

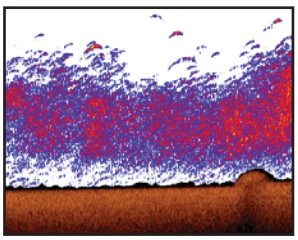
Several display palettes with varying degrees of color and brightness are available.

Bottom coloring

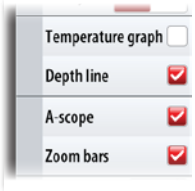
The bottom coloring option colors the entire bottom and hard structure in bottom area in one brown shade. This will clearly separate fish and vegetation from the bottom.



No bottom coloring



Bottom coloring ON

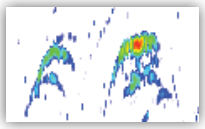


Optional echosounder image items

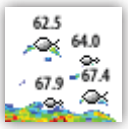
Echosounder images can be turned on/off individually. Refer graphics on page 55.

Fish echoes

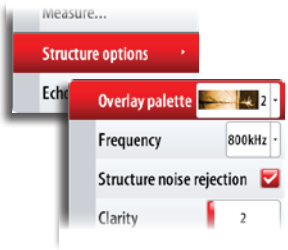
You can select how you want the echoes to appear on the echosounder image.



Traditional fish echoes



Fish symbols and depth indication



StructureScan™ overlay

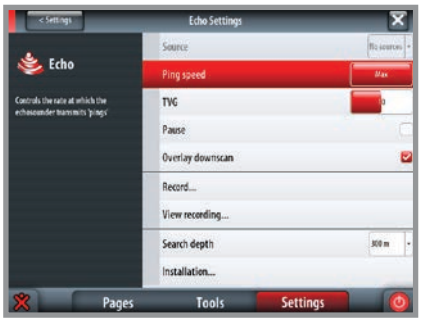
When a StructureScan unit is connected to your NSO-II system, you can overlay a DownScan image on the regular echo image.

When activated as described below, the echosounder menu will expand to include basic StructureScan options.

Gain for both images can be adjusted as described on "Adjusting color and gain settings" on page 57.

For more information about StructureScan, see "StructureScan™" on page 62.

Echosounder settings panel



Echosounder source

If you have more than one echosounder on your network, you can select which sounder to be the preferred source on this NSO-II unit.

Network echosounder

You can share the echosounder connected to this NSO-II unit on the network

For more information about how to setup echosounders, refer to the separate NSO-II Installation manual.

Ping speed

The Ping Speed controls the rate the transducer transmits into the water. A high ping speed will make the image move fast on the screen, while a low ping speed will present a longer history on the screen. The reverberation potentially caused by too high ping speed can cause interference on the screen.

TVG

Wave action, boat wakes and temperature inversion can cause on-screen clutter near the surface.

The surface clarity option reduces surface clutter by decreasing the sensitivity of the receiver near the surface.

Pausing the echosounder

Refer page 58.

Overlay downscan

When a StructureScan unit is connected to your NSO-II system, you can overlay DownScan images on the regular echo image.

When activated, the echosounder menu will expand to include basic StructureScan options. See “StructureScan™ overlay” described previously.

Recording and viewing the echosounder data

See page 58.

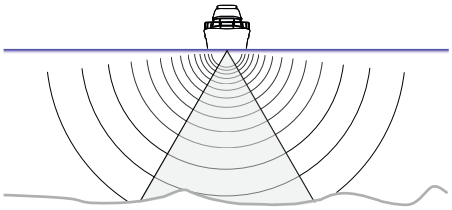
Search depth

Noise may cause the echosounder to search for unrealistic depths.

By adjusting the search depth you can avoid that such conditions interfere normal echosounder operation.

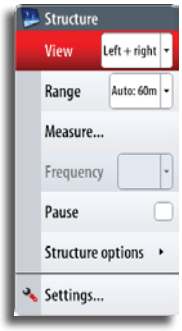
9 StructureScan™

StructureScan™ is an optional hardware module that uses high frequency to provide a High resolution image of the seabed



StructureScan™ provides a 150 m (480 ft) wide coverage in high detail with SideScan, while the DownScan™ provides picture perfect images of structure and fish directly below your boat, down to 90 m (300 ft).

The StructureScan™ panel is accessed from the shortcut icon on the **Pages** panel when the StructureScan external box and transducer are fitted.



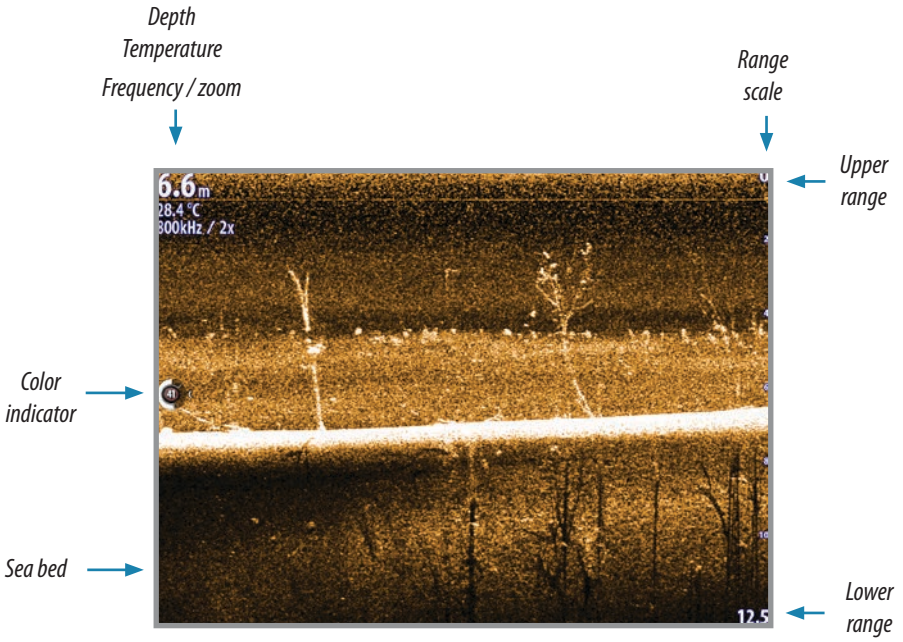
Setting up the StructureScan™ image

The view

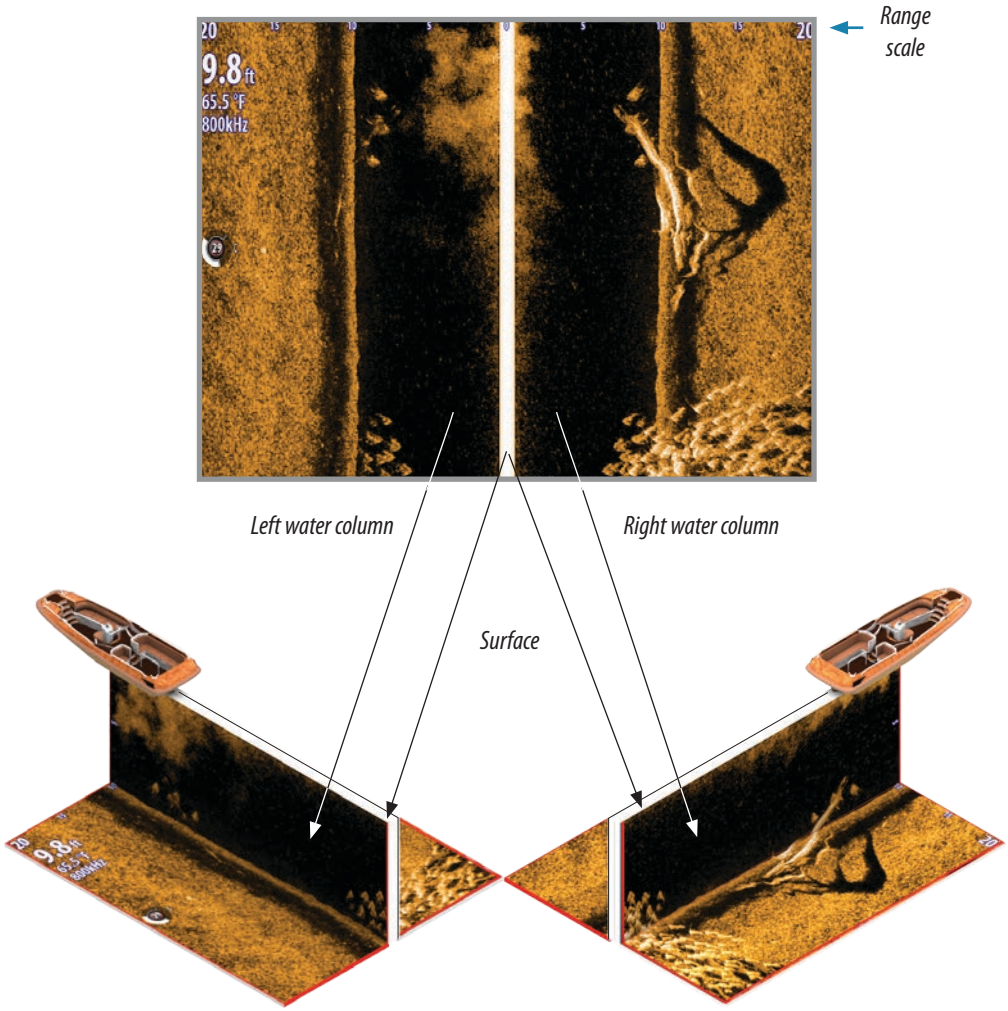
The StructureScan panel can be set up as a traditional downscan image, or showing left/right side scanning.

The DownScan image can also be added as an overlay to the traditional Echosounder image. For more information, refer to "StructureScan™ overlay" on page 60.

DownScan



SideScan



Range

The range setting determines the water depth that is visible on the screen.

Auto range

When the range is set to Auto the system will automatically set the range depending on the water depth.

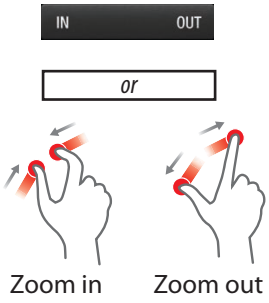
Preset range levels

You can select between several preset range levels.

When manually changing the range the upper depth line will always be at the water surface. These options allows you to focus on echoes at the upper part of the water column.

StructureScan™ Frequencies

StructureScan supports two frequencies. 455 kHz is ideal for greater depth penetration and while 800 kHz provides better definition especially at shallower depths.



Zooming

To select zooming level on the StructureScan image, you can use the **IN/OUT** keys on OP40 or simply pinch to zoom IN and spread to zoom OUT.

Zoom level is shown on the panel.

DownScan image

When zooming in on a DownScan image, the sea floor will be kept near to bottom of the screen, irrespective of whether it is in auto-range or manual range.

If the range is set considerably less than the actual depth, the unit will not be able to find the bottom when zooming.

If the cursor is active, the unit will zoom in where the cursor is pointed.

SideScan image

Zooming on a SideScan image acts as for DownScan, except that it zooms on the surface rather than trying to keep the sea floor in view.

When the cursor is active, it will zoom where the cursor is pointed.

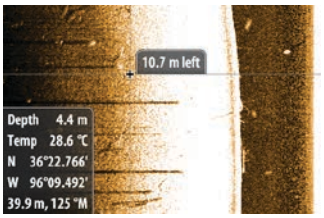
Adjusting the color settings

Strong and weak echo signals have different colors to indicate the different signal strengths. The colors used depend on which palette you select.

The more you increase the Color setting, the more echoes will be displayed in the color at the strong return end of the scale.

Color is adjustable by tapping and a vertical dragging movement or by using the OP40 rotary knob. When you press the knob the color control image will expand and display it's name in full. You can then adjust the value by turning the knob. If no adjustments are made within 3 seconds the control will return to default size.

Using the cursor on the StructureScan™ panel



The cursor is by default not shown on the StructureScan image.

When you tap the screen the cursor will appear. The left/right distance from the vessel to the cursor are shown at the cursor position, and the information window and the history bar will be activated.

To remove the cursor and cursor elements from the panel, press the **Clear cursor** panel button or the OP40 **X** key.

Viewing StructureScan history

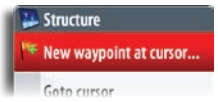
Whenever the cursor is active on a StructureScan panel, the red scroll bar is also shown. The scroll bar shows the image you are currently viewing in relation to the total StructureScan image history stored.

Depending of the view selected, the scroll bar is on the far right side (DownScan) or at the bottom of the screen (SideScan).

You can pan the image history by dragging up/down (SideScan) or left/right DownScan.

To resume normal StructureScan scrolling, press the **Clear cursor** panel button or the OP40 **X** key..

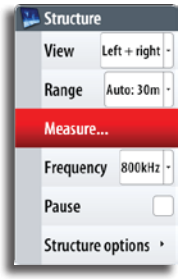
Placing a mark on a StructureScan™ image



You can position a mark at the vessel's position by pressing and holding the OP40 **PLOT/MARK** key.

You can position a mark on a selected echosounder item by tapping the screen and then activating the menu.

→ ***Note:*** Only marks positioned by using the cursor will include depth information.

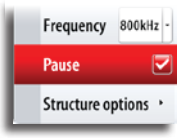


Measuring distance

The cursor can be used to measure the distance between two observations on the StructureScan image. It is easier to use the measure function when the sounder image is paused.

1. Activate the menu to start the measure function
   - The cursor will be positioned in the middle of the panel, and the distance will be measured from this position
2. Tap on the screen to select the second measuring point
   - A line will be drawn between the measuring points, and the distance will be listed in the Information window
3. Continue tapping the screen to position new measuring points

When you press the **Finish measuring** panel button or the OP40 **X** key, the echosounder will resume to normal scrolling.



Pausing StructureScan™

You can pause the StructureScan, allowing you to examine the structures and other images in more depth and detail.

This function is useful when you need to position a waponit exactly on the Structurescan image, and if you are using the cursor to measure a distance between 2 elements on the image.

Recording StructureScan™ data

You can record StructureScan data and save the file internally in the NSO-II unit, or onto an SD card as described in "Recording and viewing the echosounder data" on page 61.

Structure options

Structure palette

Several display palettes with varying degrees of color and brightness are available.

Structure noise rejection

Signal interference from bilge pumps, engine vibration and air bubbles can clutter the StructureScan image.

The noise rejection option filters the signal interference and reduces the on-screen clutter.

TVG

Wave action, boat wakes and temperature inversion can cause on-screen clutter near the surface.

The TVG option reduces surface clutter by decreasing the sensitivity of the receiver near the surface.

Flipping Left/Right image

If required, the left/right SideScanning images can be flipped to match the corresponding side of you vessel.

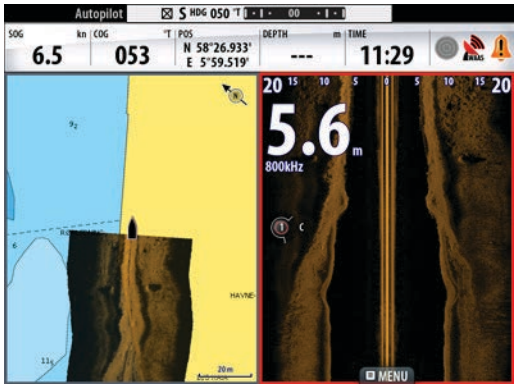
Structure source

If you have more than one StructureScan on your network, you can select which unit to be the preferred source on this NSO-II unit.

10 StructureMap

The StructureMap™ feature overlays SideScan images from a StructureScan on the map. This makes it easier to visualize the underwater environment in relation to your position, and aids in interpreting SideScan images.

The example below shows a chart panel with Structure overlay, combined with a traditional SideScan panel.



You move around in the chart as usual when you have a Structure overlay;

- zoom the chart and the scanned image by using or the OP40 **IN/OUT** keys or the pinch and spread movement
- move the chart to view scanned image by tapping the screen and dragging your finger in the selected direction

Pressing the **Clear cursor** button or the OP40 **X** key will remove the cursor from the panel, and the chart center will be positioned at the vessel.

Activating Structure overlay

1. Turn on Structure overlay from the chart menu
   - The chart menu will be increased to show Structure options
   - Structure data will start to appear on the chart screen as soon as Structure overlay is enabled
2. Select Structure source
   - Live data is default

→ *Note:* Structure overlay can also be activated by selecting a saved StructureMap file from the Files dialog.

StructureMap sources

Two sources can be used to overlay Structure logs on the charts;

- Live data, used when StructureScan units are connected to the NSO-II system
- Saved files. These are recorded StructureScan (*.sl2) data that are converted to StructureMap (*smf) format. Saved *.smf files can be used onNSO-II units even if no StructureScan units are connected.

Live source

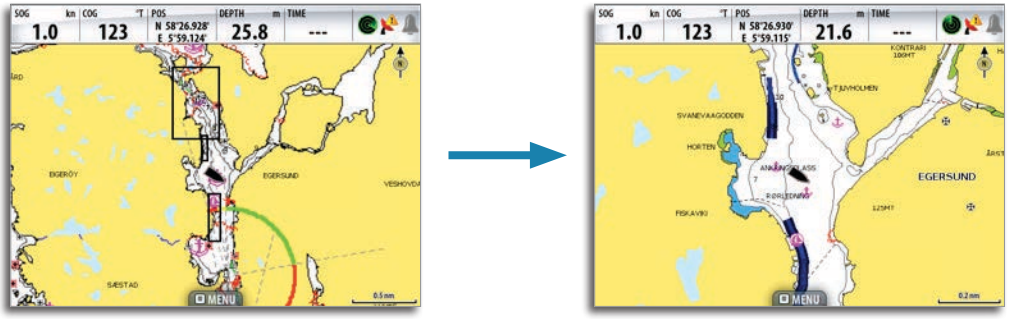
When live data is selected the SideScan imaging history is displayed as a trail behind the vessel icon. The length of this trail will vary depending on available memory in the unit and range settings. As the memory fills up the oldest data will automatically be deleted as new data is added. When increasing the search range the ping speed of the StructureScan transducer is reduced, but the width and the length of the image history will be increased.

➔ ***Note:*** Live mode does not save any data. If the unit is turned off, all recent data is lost.

Saved files

When Saved files are selected, the StructureMap file is overlaid on the map based on position information in the file.

If the chart scale is large, the StructureMap area will be indicated with a boundary box until the scale is large enough to show Structure details.



Saved mode is used to review and examine StructureMap files, and to position the vessel on specific points of interest on a previous scanned area.

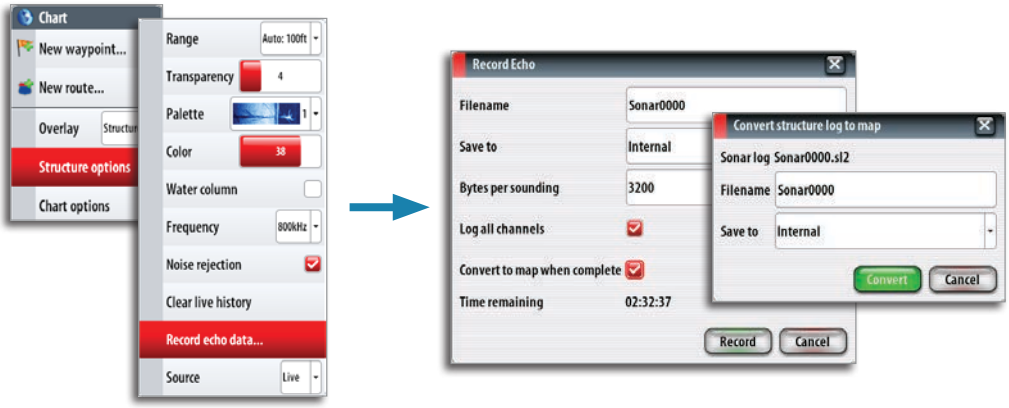
➔ ***Note:*** When saved files are used as source, the NSO-II displays all StructureMap files found on the SD card and in the system's internal memory. If there is more than one StructureMap of the same area, the images will overlap and clutter the chart. If several logs of the same area are required, the maps should be put on separate SD cards.

StructureMap tips

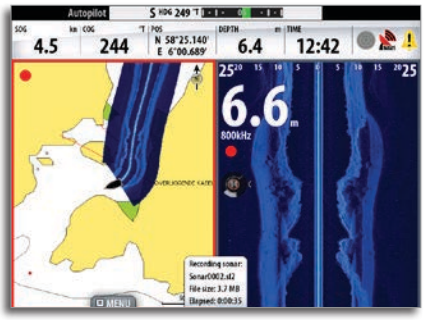
- To get a picture of taller structure (a wreck, etc) — don't drive over it. Steer the boat so the structure will be on the left or right side of your boat
- Don't use Autorange when using SideScan. Set your structure range to a significantly greater level (two-to-three times) than the water depth to ensure a complete scan and to maximize conversion accuracy
- Don't overlap history trails when conducting a side-by-side scan of an area

Recording StructureScan data

StructureScan data can be recorded from a chart panel with Structure overlay enabled.



StructureScan recordings can also be started from a StructureScan panel.



When StructureScan data is being recorded, there will be a flashing red symbol and a message will appear periodically at the bottom of the screen.

→ ***Note:*** The message includes information about file size. Keep the size of your sonar logs to 100MB or less to allow for faster file conversion.

The sounder recording is stopped by re-selecting the record function.

Converting StructureScan data to StructureMap format

A StructureScan log file (.sl2) is converted to StructureMap format (.smf) after recording from the recording dialog, or from the Files dialog.

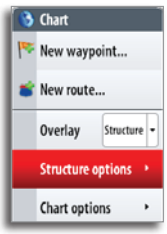
You can create standard or high resolution files. High resolution .smf files capture more detail, but take longer to convert and are larger than standard resolution files.

To save disc space it is recommended to remove the StructureScan (*.sl2) files after conversion.

Using StructureMap with mapping cards

StructureMap allows you to maintain full chart capability and can be used with embedded cartography as well as Navionics, Insight and other third-party charting cards compatible with the NSO-II systems.

When using StructureMap with mapping cards, copy the StructureMap (.smf) files to the unit's internal memory. We recommend keeping copies of StructureMap files on external SD cards.



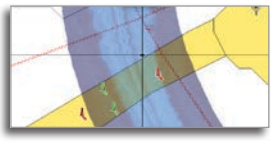
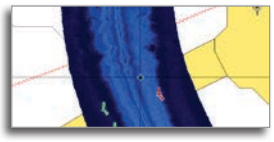
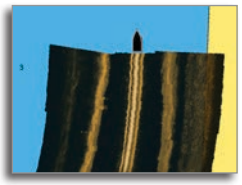
Structure options

You adjust the StructureMap settings from the Structure options menu. The menu is available when Structure overlay is enabled.

Not all options are available when saved StructureMap files are used as source. Unavailable options are greyed.

Structure Options, Live data

Structure Options, Saved data

Range	Sets the search range
Transparency	Sets the opaqueness of the Structure overlay. With minimum transparency settings the chart details will be almost hidden by the StructureMap overlay  *Transparency: Max*  *Transparency: Min*
Palette	Selects Structure palette
Color	Adjusts the intensity of the Structure image. The more you increase the color the more echoes will be displayed
Water column	Shows/hides the water column in Live mode. Turned OFF schools of bait fish might not be seen on the SideScan image. Turned ON the accuracy of the SideScan image on the map might be affected by the water depth. *Water column: OFF*  *Water column: ON*
Frequency	Sets the transducer frequency used by the unit. 800 kHz offers the best resolution, while 455 kHz has greater depth and range coverage
Noise rejection	Filters the signal interference and reduces the on-screen clutter
Clear live history	Clears existing live mode history trails from the screen and begins showing only the most current data
Record data	Records StructureScan data
Source	Selects StructureMap source

11 Instrument panels

The instrument panels consists of multiple gauges - analog, digital and bar - that can be customized to display selected data. The instrument panel displays data on dashboards, and you can define up to ten dashboards within the instrument panel.

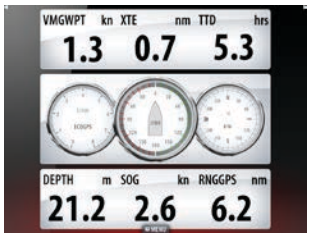
→ ***Note!*** To include fuel/engine information, engine and tank information has to be setup from the Settings panel.

Dashboards

Three dashboard layouts are predefined to display gauges showing information about vessel, navigation information and angler requirement.

You switch between a panel's dashboards by tapping the left and right side of the panel, or by selecting the dashboard from the menu.

Vessel dashboard



Navigation dashboard

Angler dashboard

→ ***Note:*** Additional dashboards can be activated. Refer to "Edit an Instrument dashboard" below.

Customizing the Instrument panel

You can customize the Instrument panel by changing the data for each of the gauges in the dashboard, by changing the dashboard layout, and by adding new dashboards. You can also set limits of analog gauges.

All edit options are available from the Instrument panel menu.

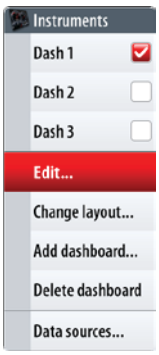
Available editing options will depend on which data sources that are connected to your system.

Edit an Instrument dashboard

Select the dashboard you want to edit, then;

1. Activate the menu
2. Select the edit option
3. Tap and hold on the gauge you want to change. The selected gauge will have a red outline
4. Select info to display

Save your changes by using the menu or by tapping the **Finish editing** panel button.

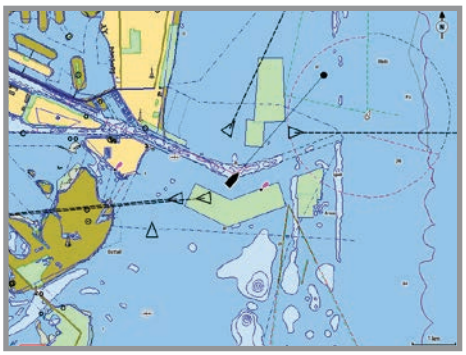


12 AIS - Automatic Identification System

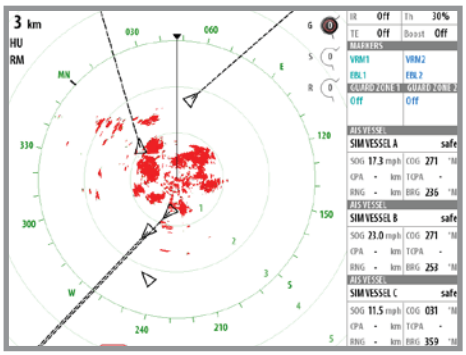
If an AIS device is connected, any targets detected by this devices can be displayed and tracked. You can also see messages and position for DSC transmitting devices within range.

AIS targets can be displayed as overlay on radar and chart images, and this feature is an important tool for safe travelling and collision avoidance.

You can define alarms to notify you if an AIS target gets too close or if the target is lost.



AIS vessels on a chart panel



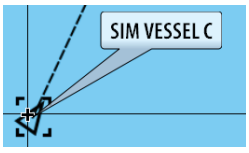
AIS vessels on a radar panel

Target symbols

The NSO-II system use the AIS target symbols shown below:

Symbol	Description	
	Sleeping AIS target (not moving or at anchor).	
	Moving and safe AIS target with course extension line.	
	Dangerous AIS target, illustrated with bold line.	A target is defined as dangerous based on the CPA and TCPA settings. Refer "Defining dangerous vessels" on page 73.
	Lost AIS target.	When no signals have been received within a time limit a target will be defined as lost. The target symbol represents the last valid position of the target before the reception of data was lost.
	Selected AIS target, activated by tapping on a target symbol.	The target will return to default target symbol when the cursor is moved.

Viewing information about AIS targets



Selecting single AIS targets

When you tap an AIS icon on the chart or radar panel the symbol will change to Selected target symbol, and the vessel name will be displayed.

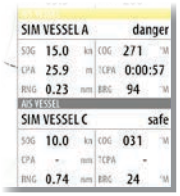
You can display detailed information for a target by activating the menu when the target is selected.

Viewing information about all AIS targets

Chart pages

From the menu, you can view information about all AIS targets within range of your vessel.

Radar pages

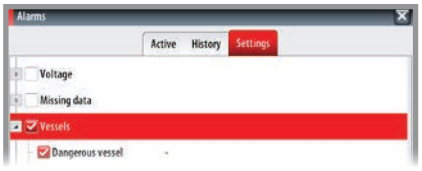


The data bar includes information on up to 3 AIS targets.

The targets are listed with the closest target on top, and are color coded to indicate target status.

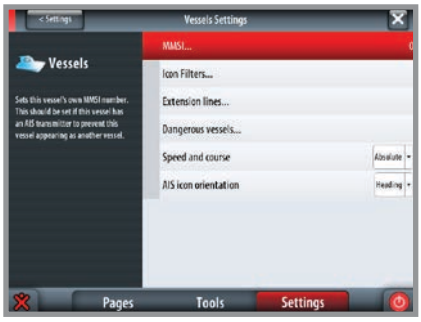
Vessel alarms

You can define several alarms to alert you if a target shows up within predefined range limits, or if a previously identified target is lost.



Alarm ID	Description
Dangerous vessel	Controls whether an alarm shall be activated when a vessel comes within the predefined CPA or TCPA. See "Defining dangerous vessels" on page 73. → ***Note:*** The check box controls whether the alarm pop-up box is displayed and if the siren will sound. The CPA and TCPA defines when a vessel is dangerous regardless of the enabled/disabled state.
AIS vessel lost	Sets the range for lost vessels. If a vessel is lost within the set range this will trigger an alarm
Vessel message	Controls whether an alarm shall be activated when a message is received from an AIS target

Vessel settings panel



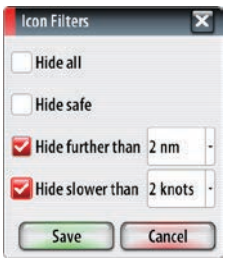
Your vessel's MMSI number

You need to have your own MMSI (Maritime Mobile Service Identity) number entered in the NSO-II system to be able to receive addressed messages from AIS and DSC vessels.

It is also important to have the MMSI number entered to avoid seeing your own vessel as an AIS target on the chart.

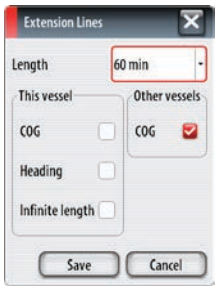
→ ***Note:*** The Vessel message option in the alarm settings must be toggled on if any MMSI message shall be displayed.

Filtering the targets



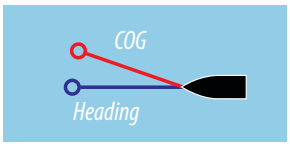
All targets are by default shown on the display if an AIS device is connected to the NSO-II system.

You can select not to show any targets, or to filter the icons based on security settings, distance and vessel speed.



Vessel's extension lines

The length of the extension lines for your vessel and for other vessels can be set by the user.

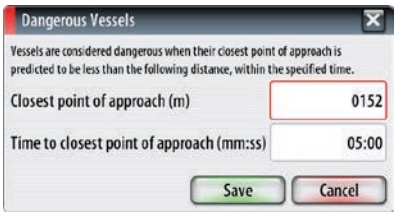


The length of the extension lines is either set as a fixed distance, or to indicate the distance the vessel will move in the selected time period.

For own vessel heading information is read from active heading sensor, and COG information is as received from the active GPS.

For other vessels COG data is included in the message received from the AIS system.

Defining dangerous vessels

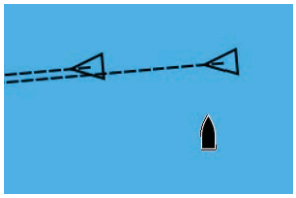

Dangerous Vessels
Vessels are considered dangerous when their closest point of approach is predicted to be less than the following distance, within the specified time.
Closest point of approach (m)
0152
Time to closest point of approach (mm:ss)
05:00
Save
Cancel

You can define an invisible guard zone around your vessel. When a target comes within this distance from your vessel, the symbol will change to the "dangerous" target symbol. An alarm will be triggered if activated in the Alarm settings panel.

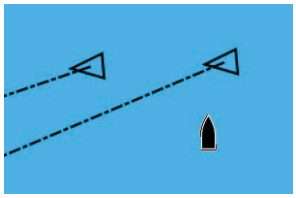
Speed and course indication

The extension line can be used to indicate speed and course for targets; either as absolute (true) motion in the chart or relative to your vessel.

Different line style is used on the extension lines to indicate motion as shown below.



Absolute motion



Relative motion

AIS icon orientation

Sets the orientation of the AIS icon; either based on heading or COG information.

AIS SART

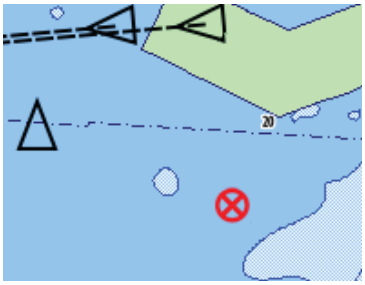
When an AIS SART (Search And Rescue beacon) is activated, it starts transmitting its position and identification data. This data is received by your AIS device.

If your AIS receiver is not compliant with AIS SART, it interprets the received AIS SART data as a signal from a standard AIS transmitter. An icon is positioned on the chart, but this icon is an AIS vessel icon. Refer icon description in the NSO-II Operator manual.

If your AIS receiver is compliant with AIS SART, the following take place when AIS SART data is received:

- An AIS SART icon is located on the chart in the position received from the AIS SART
- An alarm message is displayed

If you have enabled the siren, the alarm message will be followed by an audible alarm.



The following section describes the options available when an AIS SART message is received by a Navico NAIS-400 transponder.

AIS SART alarm message

When data is received from an AIS SART, an alarm message is displayed on the NSO-II . This message includes the AIS SART's unique MMSI number, its position and its distance and bearing from your vessel. You have three options:

1. Ignore the alarm
   - The alarm is muted and the message closed. The alarm will not reappear

➔ ***Note:*** If you ignore the alarm, the AIS SART icon remains visible on your chart, and the AIS SART remains in the Vessels list.
If the AIS stops receiving the AIS SART message, the AIS SART remains in the Vessels list for 10 minutes after it receives the last signal.

2. Save the waypoint
   - The waypoint is saved to your waypoint list. This waypoint name will be prefixed with MOB AIS SART - followed by the unique MMSI number of the SART. e.g. MOB AIS SART - 12345678.
3. Activate the MOB function
   - The display switches to a zoomed chart panel, centered on the AIS SART position
   - The NSO-II creates an active route to the AIS SART position

➔ ***Note:*** If the MOB function is already active, this will be terminated and replaced by the new route towards the AIS SART position!

If you select the AIS SART icon on the chart you will see the AIS MOB details.

13 Audio

When the NSO-II is connected to a SonicHub server you can use your unit to control audio playback from iPod, iPhone, USB mass storage device (mp3) and AM/FM radio. Before playing FM radio you must purchase a marine-grade AM/FM antenna.

When connected to a WM-2 Satellite module you can subscribe and include Sirius™ audio on your NSO-II system. Sirius™ audio and weather service covers inland US waters and coastal areas into the Atlantic and Pacific oceans, Gulf of Mexico and the Caribbean Sea. The Sirius™ audio products received vary depending on your selected subscription package. For more information refer to www.sirius.com.

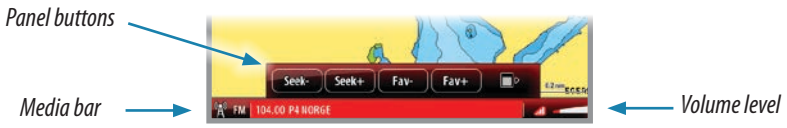
Before you can start using your equipment, it must be installed according to the Installation manual included with the unit.

Enabling audio

You must enable audio to control audio on your NSO-II unit.

Audio media bar

When audio is enabled, the media bar will appear at the bottom of the screen on all pages. The media bar varies from one audio source to another.

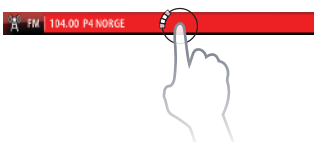


You switch focus between other panels and the media bar by tapping on the selected panel.

Audio menus

When you tap the media bar, the audio panel buttons are displayed. Tapping the screen again makes these go away.

When the media bar is active you can display the full audio menu by:

	• Tapping the **MENU** panel button	
	• Pressing and holding on the media bar	

The menus differ from one audio source to another as shown in the following sections.

Setting up the SonicHub speakers

Speaker zones

Your unit has four on-board amplified channels for directly driving speakers. There are also two low level channels (stereo) for supplying signal to an external amplifier, plus two mono channels for amplified subwoofer(s).

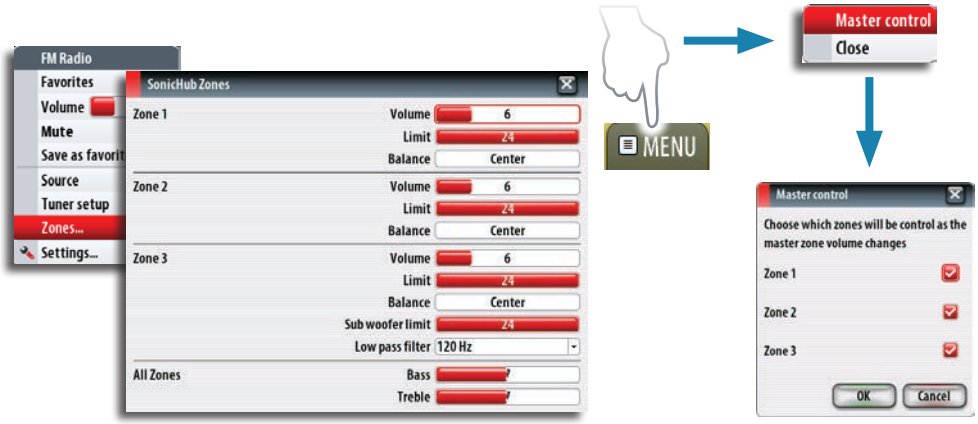
The audio outputs are organized in 3 zones. You can adjust balance, volume and volume limit settings independently for each zone. Adjustments to the bass and treble settings will alter all zones. Refer graphics.

Zone 1	Left/Right speakers
Zone 2	Left/Right speakers
Zone 3	Amplifier output, Subwoofer output

Master volume control

By default the volume for all speaker zones are adjusted when you adjust the volume on an NSO-II unit.

You can adjust each speaker zone individually from any NSO-II unit from the SonicHub Zones dialog. From this dialog you can also define which zones shall be altered when you increase/decrease the volume from the control unit.



Operating the audio source

Selecting the audio source

You switch between available audio sources from the audio menu.

→ *Note:* The Mic source selects a high voltage level input allowing you to broadcast loud hailer messages over the audio system.

Adjusting the volume

The volume is adjusted by using the OP40 rotary knob or by tapping the volume level icon and then dragging your finger on the slide bar.

The volume can also be adjusted by using the menu, and from the master control dialog as described later in this chapter.

Muting

You toggle muting on/off by pressing the OP40 rotary knob.

Audio playback

Playback panel buttons

	• Tap	Display source's native menu
	• Tap	Play previous track
	• Tap	Play
	• Tap	Play next track
	• Tap	Display audio menu

Shuffle and repeat

Shuffle (e.g. tracks or albums) and repeat is turned on/off from the audio menu, or by tapping the icons in the media bar will switch between all repeat/shuffle modes and then to off. The icons will be red when the function is turned on.

Playback menu

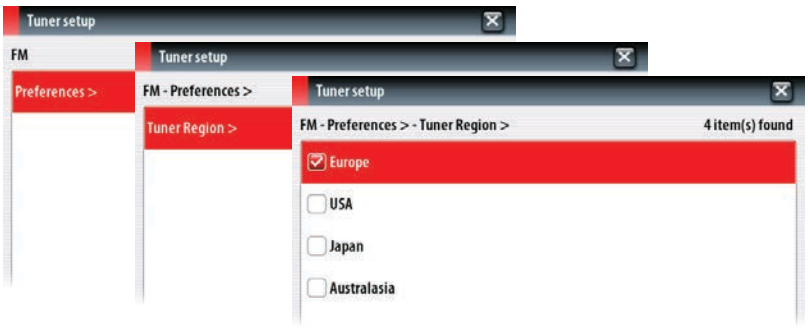
The playback menus include an option giving access to the source's native menu or file structure, used for selecting tracks.

The examples show iPod menus.

Using the FM/AM radio

Selecting AM/FM tuner region

Before playing FM or AM radio, you must select the appropriate AM and FM tuner regions for your location.



AM/FM panel buttons

	• Tap and hold	Tune in to an AM/FM radio channel
	• Tap	Goto previous/next station in favorite list
	• Tap	Display audio menu

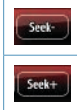
Saving a channel to the favorite list

When the channel is tuned in, you can add the stations to your favorite list.

All favorite channels can be viewed, selected and deleted from within this list.

Using the Sirius radio

Sirius panel buttons

	• Tap and hold	Tune in to a Sirius radio channel
	• Tap	Goto previous/next station in favorite list
	• Tap	Display audio menu

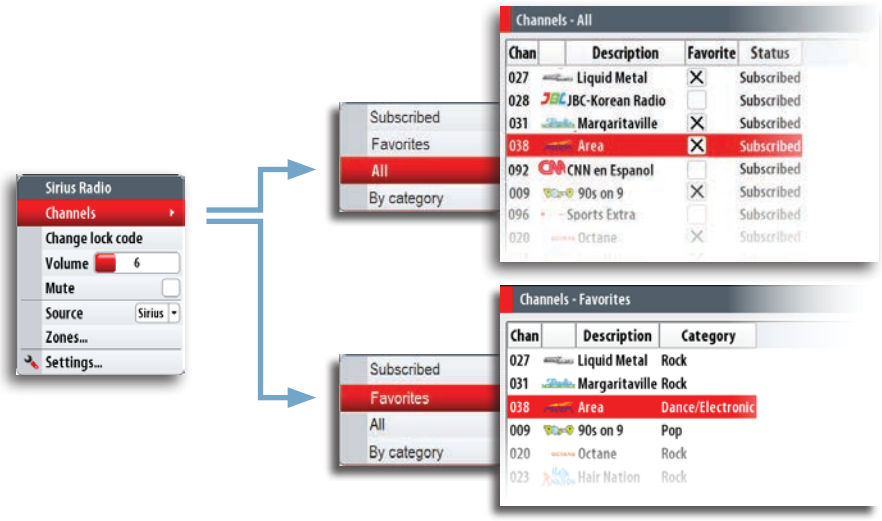
Channels list

The channels list displays all available Sirius channels, whether or not you have a subscription for the channel.

Favorite list

You can create a list of your favorite Sirius channels from within the channels list. You will not be able to add unsubscribed channels.

When a favorite list is available, you page through this list using the panel buttons.



Locking channels

You can lock selected Sirius channels from being broadcasted unless an unlock code is entered.

When the function is activated, a 4 digit code must be entered before the locking is activated.

The same code must be entered before a locked channel can be released.

FUSION-Link Support

Compatible FUSION-Link devices connected to the NMEA 2000 network can be controlled from the NSO-II.

The integration is currently limited and not supporting the following features:

- Multiple FUSION-Link device connectivity
- VHF channel and Sirius weather controls via FUSION-Link devices
- DVD controls through the NSO-II

➔ ***Note:*** You must enable audio to control audio on your NSO-II.

Refer to the Audio section in the NSO-II Operator for information about audio control from the NSO-II.

A compatible FUSION-Link device connected to the NMEA 2000 network should automatically be identified by the NSO-II. If not, enable the feature from the advanced option in the system settings menu.

➔ ***Note:*** Only one audio device is allowed - either a SonicHub or a FUSION-Link capable device, but not both.

14 Weather

GRIB weather

The NSO-II includes a GRIB data viewer. You can import GRIB files via an SD card inserted into the card reader, and overlay the information onto your charts.

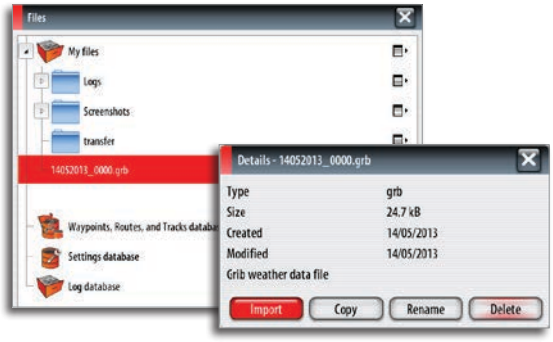
The GRIB data is available for download from www.grib.us

Importing GRIB data

GRIB data must be imported into memory before it can be used. The file can be imported directly from an SD card, or from the NSO-II if you have previously copied the file to the device.

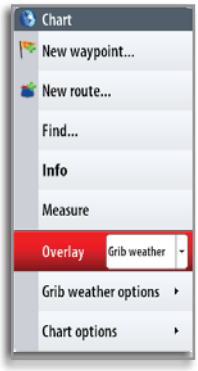
→ ***Note:*** GRIB data that is imported from an SD will not be saved in the NSO-II. The data will be lost when new GRIB data is imported.

Select the GRIB file on the SD card or on the device to import the data.



The GRIB weather display

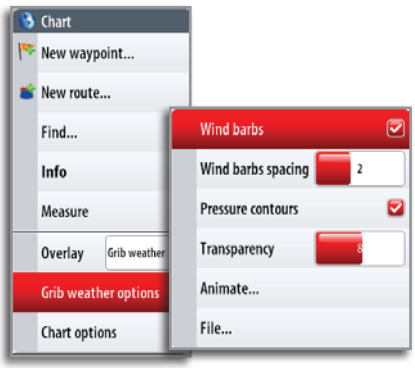
Imported GRIB weather data can be displayed as an overlay on your chart panel.



Wind barbs

Pressure contours

GRIB information window



When the GRIB weather overlay is selected, the chart menu will increase to show GRIB weather options. From this menu you can select which weather symbols you want to display, set the distance between the barbs, and you can adjust the opaqueness of the weather symbols.

From this menu you can also animate the weather forecast as described later in this chapter.

Wind barb symbols

The rotation of the wind barbs indicate the wind direction.

Wind speed is indicated by a combination of small and large barbs at the end of the wind tail.

◎	Zero knots / Indeterminate wind direction
	Small barb = 5 knots
	Large barb = 10 knots
	Arrow barb = 50 knots

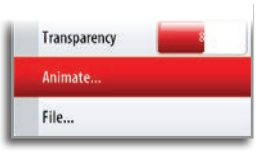
If a combination of 5 and 10 knot barbs are shown on a tail then these will need to be added together to give you the total wind speed. The example below shows 3 x large barb + 1 x small barb = 35 knots, and 60 knots indicated with 1 x arrow barb + 1 x large barb.

Wind speed: 35 knots

Wind speed: 60 knots

Animating GRIB weather forecast

The GRIB data contains forecast information for a set number of days. It is possible to animate the weather data and to show the predicted forecast for a specific time and date. The time scales will vary depending on the file you are using.



Once animation is selected, the **Clear time control** panel button is displayed at the top of the chart panel. Time and speed dials will appear on the right side of the panel.

- Press the OP40 rotary knob to change between the time and speed dials
- Press the **Clear time control** panel button to stop the animation

Selecting time

Turn the OP40 rotary knob to select the time for which you want to display the weather data. The time increments may vary depending on the GRIB file.

The time shift is shown in the time dial and in brackets in the GRIB information window. The time will be relative to the current time as provided by a GPS device connected to the NSO-II.

As a GRIB file ages it will be possible to see the historic data represented in minus hours until the data becomes outdated. Once the data is outdated it reverts to the time frame being relative to the earliest forecast in the file.

➔ ***Note:*** If no current time is provided via GPS the GRIB file time is only relative to the earliest forecast in the file. It will then not show a real time weather representation.

Animation speed

Use the OP40 rotary knob to adjust animation speed.

SiriusXM™ weather (North America only)

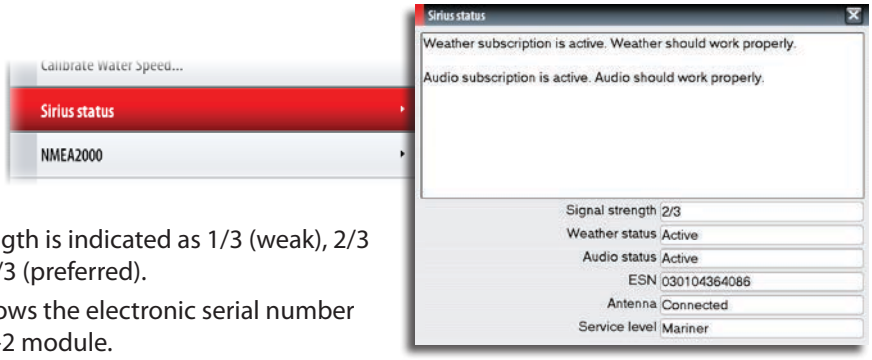
When connected to a Navico Weather Module WM-2, you can subscribe and include Sirius™ audio and Sirius™ Marine Weather Service on your NSO-II system (North America only).

Sirius™ audio and weather service covers inland US waters and coastal areas into the Atlantic and Pacific oceans, Gulf of Mexico and the Caribbean Sea.

The audio and weather products received vary depending on your selected subscription package. For more information refer to www.siriusxm.com/marineweather

Sirius™ status panel

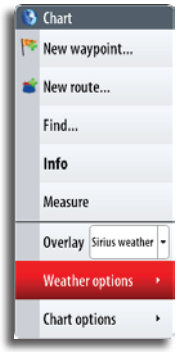
When the WM-2 is connected to the system, you will get access to the Sirius™ status panel.



Signal strength is indicated as 1/3 (weak), 2/3 (good) or 3/3 (preferred).

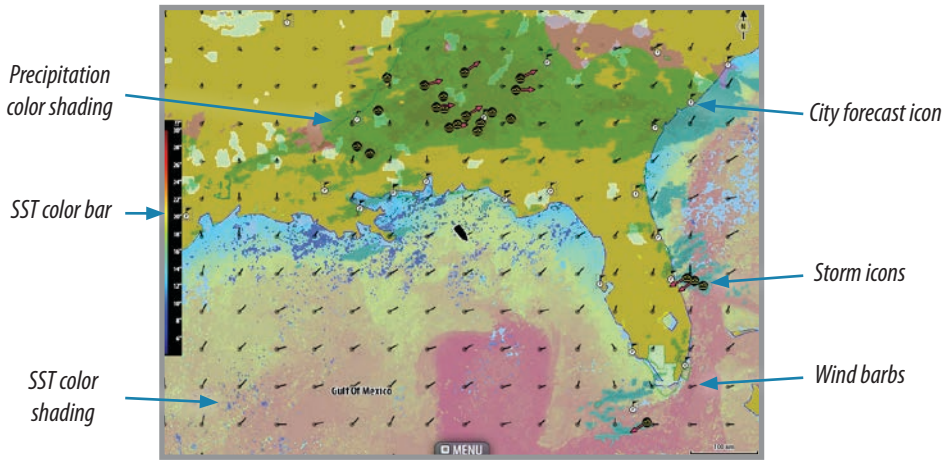
The ESN shows the electronic serial number for the WM-2 module.

Weather display

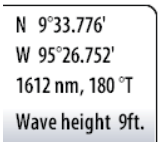


The Sirius™ weather can be displayed as an overlay on your chart panel.

When weather overlay is selected, the chart menu will increase to show the available weather options.

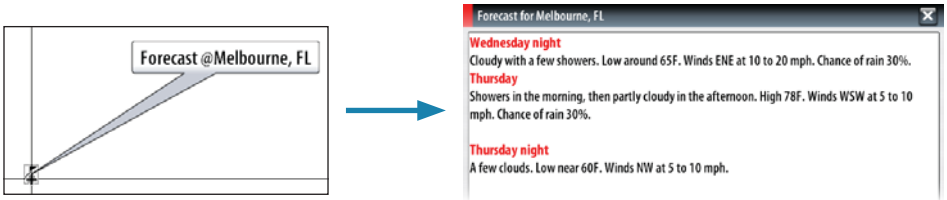


Showing detailed weather information

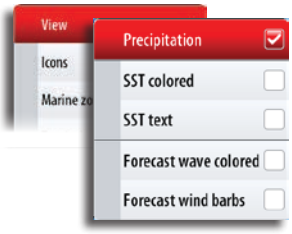


When you tap a shaded weather area, available information will be shown in the cursor window.

When you tap a weather icon, detailed information about the observation can be displayed by using the menu or by pressing the OP40 rotary knob.


Forecast @Melbourne, FL
Forecast for Melbourne, FL
Wednesday night
Cloudy with a few showers. Low around 65F. Winds ENE at 10 to 20 mph. Chance of rain 30%.
Thursday
Showers in the morning, then partly cloudy in the afternoon. High 78F. Winds WSW at 5 to 10 mph. Chance of rain 30%.
Thursday night
A few clouds. Low near 60F. Winds NW at 5 to 10 mph.

Weather symbology



Precipitation

Shades of color are used to show precipitation type and intensity. Darkest color indicates highest intensity.

Precipitation type	Color codes
Rain	From light green (light rain) - yellow - orange - to dark red (heavy rain)
Snow	Blue
Mixed	Pink

Sea surface temperature (SST)

Can be shown as color shading or text.

When color coding is selected, the SST color bar will be shown on the left side of the display.

You can define which temperature range that shall be color coded as described later in this section.

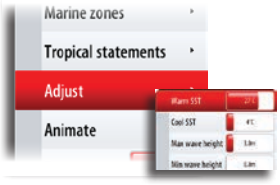
Wave indication

Colors are used to indicate forecasted wave height. Dark red indicate the highest waves, while blue are used for the lowest.

You can define which height range shall be color coded as described later in this section.

Wind symbols

Length and rotation of the barbs indicate wind direction and speed.



Adjusting the color shading

You can define the sea surface temperature range and wave height color coding.

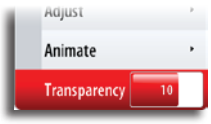
The temperature above warm and below cool values will be displayed as progressively darker red and darker blue.

Waves higher than the maximum value will be indicated with progressively darker red. Waves lower than the minimum value will not be color coded.

Weather icons

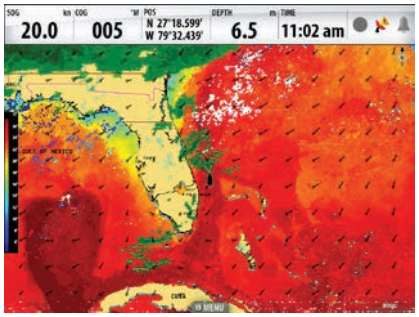
Several weather icons are available to show current or predicted weather conditions. You can tap an icon to display detailed weather information.

Icon	Description
	City forecast
	Surface observation
	Tropical storm tracking; past (grey) - present (red) - future (yellow)
	Hurricane (category 1-5) tracking; past (grey) - present (red) - future (yellow)
	Tropical disturbance/depression tracking; past (grey) - present (red) - future (yellow)
	Storm attributes
	Lightning
	Watch box location and warning
	Marine zone location

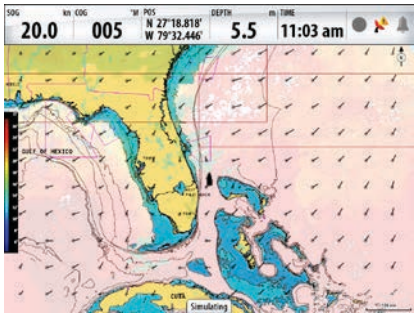


Weather overlay transparency

The opaqueness of the weather overlay can be adjusted.



Min transparency



Max transparency

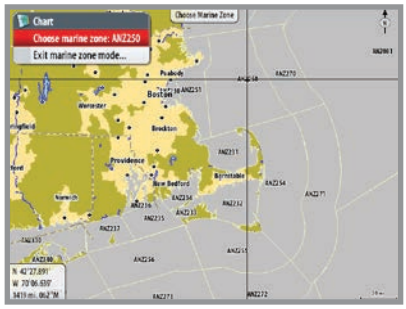
Weather reports

Marine zone

Sirius™ service includes access to weather reports for all U.S. Marine Zones, with the exception of the high seas zones..

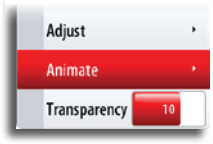
You can setup the system to read the forecast for a selected area.

Tap the selected zone, and use the menu to confirm your selection.



Tropical statements

You can read tropical statements including information about tropical weather conditions. These statements are available for the entire Atlantic and the Eastern Pacific.

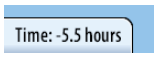


Animating Sirius™ weather graphics

The NSO-II records the weather information you have turned on, and this information can be used to animate past or future weather conditions. The amount of information available in the system depends on the amount of weather activity; the more complex it is, the less time will be available for animation.

You can animate the past or the future, depending on which weather view you have turned on:

- if the precipitation overlay was turned on, you can animate for the past and only assume weather conditions in the immediate future.
- if the colored wave height overlay was turned on, you can animate the future (the predictions).



When activated, the time for the current graphic animation will be displayed in the lower left corner of the chart panel.

Weather alarms

You can setup the lightning or storm alarms to be within a certain range of your vessel.

You can also get an alarm as a severe weather forecast alarm issued for your chosen marine zone.

A watchbox is defined by the National Weather Service. When the alarm is turned on you will get an alarm when your vessel is inside or is entering into a watchbox.

15 Video

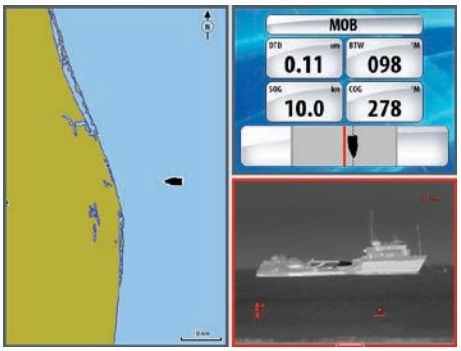
The video function allows you to view videos or camera sources on your NSO-II screen. For information about how to connect the camera, see the separate NSO-II Installation manual.

➔ ***Note:*** The video images will not be shared via the network. You can only view the video on the unit connected to the video source.

Video panel

The video image will be proportionally scaled to fit into the video panel. Area not covered by the image will be colored black.

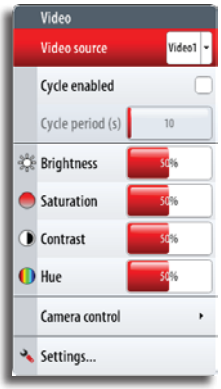
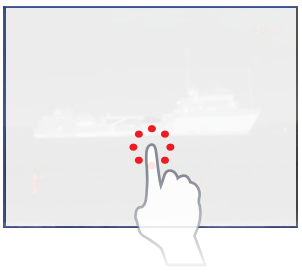
The graphics below show images from a thermal imaging camera.



Video menus

When you tap the video panel, the video panel buttons are displayed. Tapping the screen again makes these go away.

When the video panel buttons are active you can display the full video menu by:

	• Pressing the panel button or the OP40 **MENU** key	
	• Pressing and holding on the video panel	

Setting up the video panel

Video source

NSO-II supports two video input channels. You can select to view one channel only, or to cycle the image between available video cameras.

The cycle period can be set from 5 to 120 seconds.

Adjusting the video image

You can optimize the video display by adjusting the video image settings. The settings are adjusted individually for each video source. Default for all settings: 50%.

Mirroring the video image

Video input can be set to display a mirrored image. This setting can be helpful for rear-

facing cameras used to back-down the vessel.

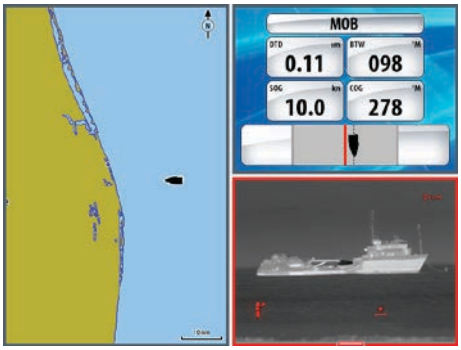
Video standard

NSO-II supports NTSC and PAL video. The two channels are set up individually. Check the local video standard or the standard of your cameras.

FLIR camera control

If a FLIR camera is available on the Ethernet network, you can display the video and control the camera from the NSO-II.

A video panel can be set up as a single panel, or as one of the panels on a multiple panel page.



Establishing connection with the FLIR video camera

When a video panel is active, the NSO-II will automatically recognize a Flir camera if this is available on the network.

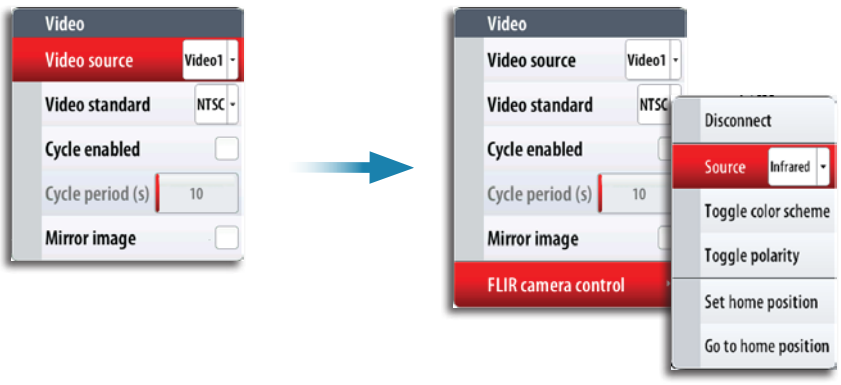
→ ***Note:*** When there is DHCP server present on the Ethernet network, FLIR camera will need to be configured and set to have Static IP Address before the connection can be established. For instructions on how to configure your specific FLIR camera model please refer to FLIR documentation.

→ ***Note:*** Only one FLIR camera can be connected to the Ethernet network at a time.

When you activate a video panel, the system will start searching the network for a FLIR camera.

If the connection later is lost, this will be indicated by a panel key. Tap this key to re-establish the connection.

When the connection is established the menu will change to include access to FLIR camera control.



➔ ***Note:*** You can take over camera control from any NSO-II unit connected to the Ethernet network.

Panning and tilting the camera

When the connection to the FLIR camera is established, pan and tilt panel buttons appear on the video panel. The left and right arrows control the camera's pan, while the up and down arrows tilt the camera.

Press one of the arrow buttons on the panel to control the camera. The camera will move as long as you press the button.

Zooming the video image

You zoom the video image by using the OP40 **IN**/**OUT** keys. or the pinch/spread movement on the screen.

There are two different zoom options available, depending on selected FLIR camera source option. Refer "The FLIR camera source options" below.

Digital zoom

Only available when the camera is in Infrared mode.

In this mode the zoom is represented in levels (0, 2 and 4 times zoom). Each press on one of the OP40 **IN**/**OUT** keys will increment or decrement the zoom level.

Optical zoom

Available in daylight mode.

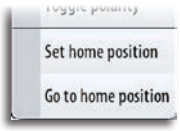
In this mode the camera will zoom as long as you press the OP40 **IN**/**OUT** keys.

The FLIR camera source options

The FLIR camera includes both daylight and infrared video sources.

When the infrared source is selected, the following options are available:

Toggle color scheme	Cycles through FLIR's video output color scheme. Each of these schemes maps a different color to a different temperature
Toggle polarity	Inverts the color scheme. For example, instead of: White = Hot and Black = Cold, it will become Black = Hot and White = Cold



The camera's home position

You can set the current pan and tilt position as the camera's home position.

You can later quickly return to this camera position.

16 BEP CZone

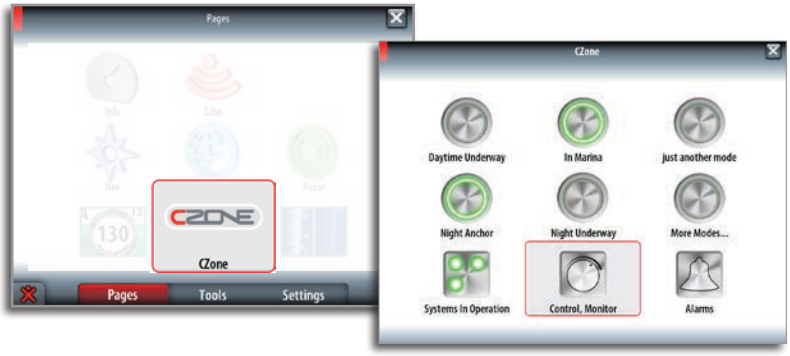
The NSO-II system integrate with BEP's CZone system used for controlling and monitoring a distributed power system on your vessel.

A separate manual will be provided with your CZone system. Refer to this documentation and to the NSO-II Installation manual for how to install and configure the CZone system.

BEP CZone panel

Quick access to CZone panel from Pages

When the CZone system is connected and configured, the CZone icon will be shown on the Pages overview panel (Home). This icon gives access to CZone panel, providing icons for CZone modes.



CZone modes

The CZone modes provide a one press functionality that allows multiple circuits to be controlled efficiently. The modes are configured during installation of the system.

All available modes will be displayed on the CZone panel.

If there are more than 6 modes configured on screen the rest of the modes will move to the ***More Modes*** option.

Intuitive CZone modes status icon

The CZone modes provide a one press functionality that allows multiple circuits to be controlled efficiently. The modes are typically configured during installation.

Up to 6 commonly used modes can be displayed on the CZone panel. If more than 6 modes are configured, the rest are accessible under ***More Modes...*** option.

Mode is active

Mode is inactive

CZone system overview options

Enables you to monitor all on board parameters including tank levels displayed in graphical, percentage and remaining volume formats.

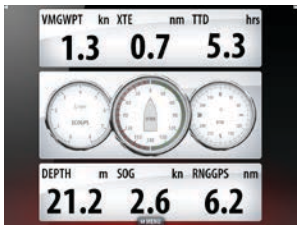
Shows control options and monitoring information.

Displays visual and audible alarms that can be set for high and low levels.

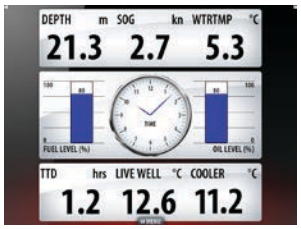
CZone info panel

When the CZone is installed and configured, an additional CZone dashboard will be added to the Instrument panels.

Vessel dashboard



Navigation dashboard



Angler dashboard

CZone dashboard

You switch between a panel's dashboards by tapping the left and right arrow symbols or by selecting the dashboard from the menu.

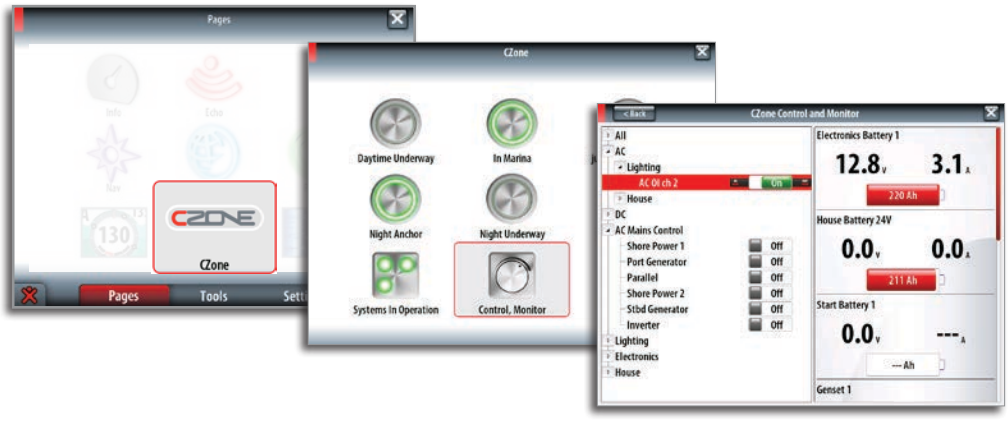
See "Instrument panels" on page 70 for further information.

Editing the CZone dashboard

You can customize CZone dashboard by changing the data for each of the gauges. Available editing options will depend on the type of gauge and which data sources are connected to your system.

CZone AC Main Control Interface (AMCI) and AC Output Interface (ACOI) support

AMCI allows you to select which mains power device will supply power to the vessel. ACOI provides on/off control and power distribution protection for AC devices on the vessel. AC controls are configurable under Control and Monitor panel.



17 Alarm system

The NSO-II system will continuously check for dangerous situations and system faults while the system is running. When an alarm situation occurs, an alarm message will pop up on the screen.

If you have enabled the siren, the alarm message will be followed by an audible alarm, and the switch for external alarm will go active.

The alarm is recorded in the alarm listing so that you can see the details and take the appropriate corrective action.

Type of messages

The messages are classified according to how the reported situation will affect your vessel. The following color codes are used:

Color	Importance
Red	Critical
Orange	Important
Yellow	Standard
Blue	Warning
Green	Light warning

Single alarms

A single alarm is displayed with the name of the alarm as the title, and with details for the alarm.

Multiple alarms

If more than one alarm is activated simultaneously, the alarm message will display a list of up to 3 alarms. The alarms are listed in the order they occur with the alarm activated first at the top. The remaining alarms are available in the Alarms dialog.

Acknowledging a message

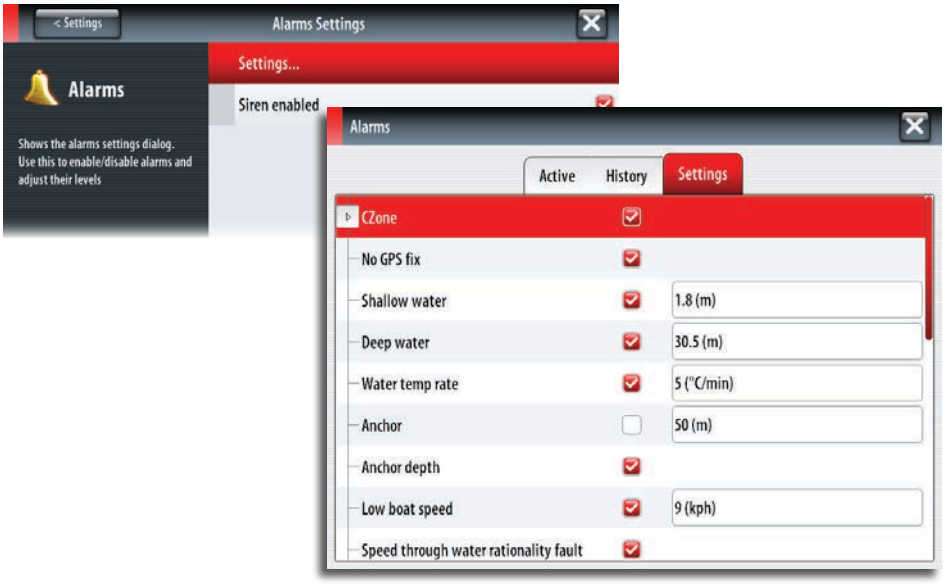
The following options are available in the alarm dialog for acknowledging a message:

Option	Result
OK	Sets the alarm state to acknowledged, meaning that you are aware of the alarm condition. The siren / buzzer will stop and the alarm dialog will be removed. The alarm will however remain active in the alarm listing until the reason for the alarm has been removed.
Disable	Disables the current alarm setting. The alarm will not show again unless you turn it back on in the Alarms dialog.

There is no time-out on the alarm message or siren. They remain until you acknowledge the alarm or until the reason for the alarm is removed.

Alarms dialog

The alarms can be setup in the Alarms dialog. This dialog also includes information about active alarms and alarm history.



The alarms are described in the chapter describing the corresponding feature e.g. all autopilot alarms are described in the ***Autopilot*** section.

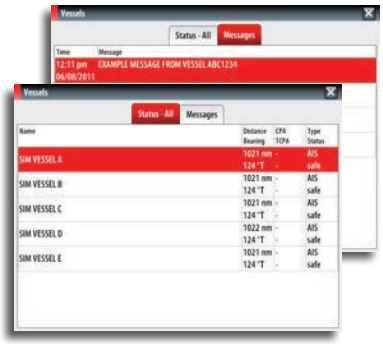
18 Tools page

The Tools dialog includes options and tools that are not specific to any panel. This dialog and sub-screen dialogs are always full screen.

A tools dialog will open on top of your previous page. When you close one of these dialogs the display will return to last active page.

Any listing in the tools dialogs has a page menu, giving access to available options for the selected item. The menu is displayed by tapping and holding on the screen or by pressing the OP40 **MENU** key..

Vessels



Status listing

List of all AIS, MARPA, and DSC vessels with available information.

Message listing

List of all messages received from other AIS vessels with time stamp.

Alarms

Active alarms

List of active alarms.

Alarm history

List of all alarms with time stamp.

Alarm settings

List of all available alarm options in the system, with current settings.

Satellites

Status page for active satellites.

WAAS (and EGNOS) differential position correction can be configured to On or OFF.

Find

Search function for several chart items.

Waypoints/routes/tracks

List of waypoints, routes and tracks with details.

Tap on the waypoint, route or track you wish to edit or delete

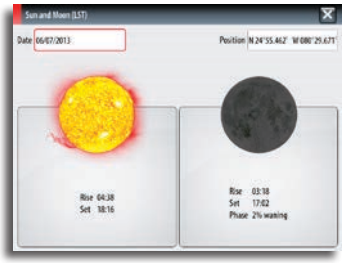
Trip Log

Trip 1 / Trip 2
Displays voyage and engine information, with reset option for all data fields.

Today
Displays voyage and engine information for current date. All data fields will be automatically reset when the date changes.

Sun/moon

Displays sunrise, sunset, moonrise and moonset for a position based on entered date and the position's latitude/longitude.

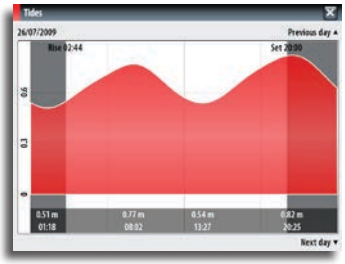


Tides

Displays tide information for the tide station nearest to your vessel.

Tap the arrow panel buttons to change date, or tap the date field to access the calender function.

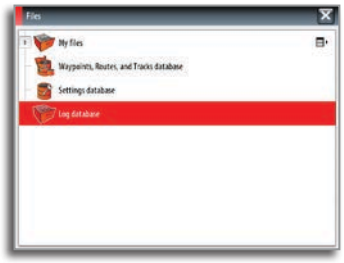
Available tide stations can be selected from the menu.



Files

File management system for files, waypoints, routes, tracks and settings.

NMEA 0183 Data logging



All serial output sentences sent over the NMEA 0183 TCP connection are logged to an internal file. You can export and review this file for service and fault finding purposes.

The maximum file size is predefined. If you have added several other files to the system (sonar and/or StructureMap recordings, music, pictures, pdf files), this may reduce the allowed file size for the log file.

The system logs as much data as possible within the file size limitation, then it starts overwriting the oldest data.

Exporting the log file

The log file can be exported from the Files dialog.

When you select the Log database you are prompted to select a destination folder and filename. Once accepted the log file is written to the chosen location.

19 GoFree™ wireless

With a WIFI-1 unit connected to an NSO-II you can use a wireless device to remotely control the NSO-II. The NSO-II is controlled from the wireless device by Apps downloaded from their relevant Application store.

→ ***Note:*** In this document we have used the term **wireless devices**, and graphics from iPad and App Store are used as examples. The wireless functionality is however, provided for other vendors' tablets or smartphones, and those can be used for controlling the NSO-II when relevant Apps are available.

→ ***Note:*** For security reasons Autopilot and CZone control are currently not supported for control from a wireless device.

Installation and wiring for the WIFI-1 unit are described in the separate WIFI-1 Installation Guide.

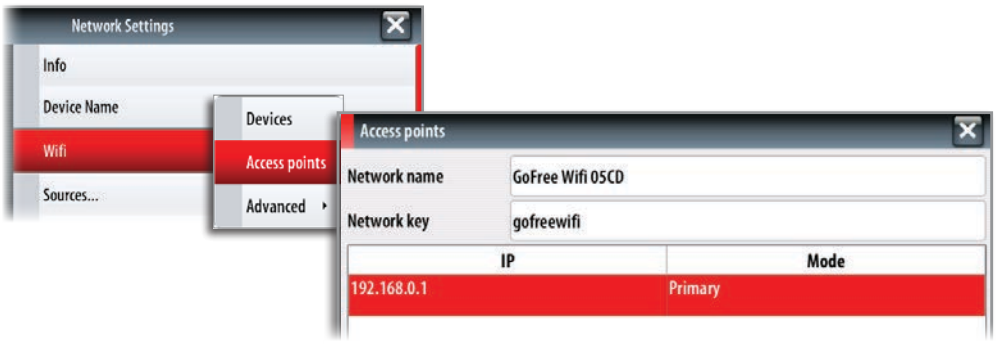
Setting the NSO-II name

The name of the NSO-II can be set by the user. The entered name will be broadcasted on NMEA 2000 and IP based networks.

Choose a unique name for the NSO-II to allow you to identify each unit on the Simrad GoFree Controller & Viewer App.

Setting up the WIFI-1

1. Connect the WIFI-1 unit to the NSO-II with the Ethernet cable supplied with the WIFI-1 unit:
   - The WIFI-1 access point will now be listed in the NSO-II menu
   - The **Network name** and **Network key** are the same as found on the sticker on the WIFI-1 unit
2. Change the **Network name** and **Network key** if required.

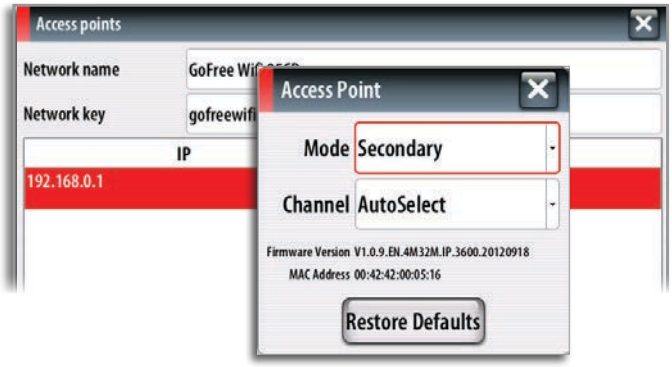


Setting up multiple WIFI-1 units

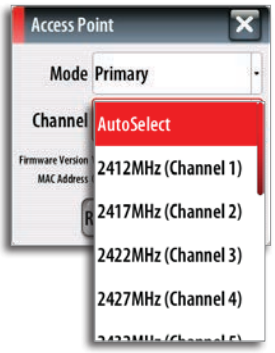
On large or metal hulled vessels it may be necessary to connect multiple WIFI-1 access points to extend the range.

Up to 2 WIFI-1 units can be connected to one NSO-II, but only the WIFI-1 unit defined as primary access point can be used for connecting the wireless device to the NSO-II.

1. Open the access points' dialog as shown above
2. Activate the line for the connected WIFI-1 unit, and re-define this to be a secondary access point



3. Connect and define the additional WIFI-1 unit as described in "Setting up the WIFI-1" on page 95.
   - The latest connected WIFI-1 unit will now be the primary access point, and only this can be used for connecting the wireless device to the NSO-II.



Selecting communication channel

The WIFI-1 unit will automatically select the channel used for communication with the wireless devices.

You might need to change the channel if other transmitting devices cause conflicts (multiple networks, wireless phones etc), or if you are using the equipment in areas with restricted channel selection.

The channels can be manually changed from the drop down list.

→ ***Note:*** Only technically skilled persons should set up multiple WIFI-1 units or change the communication channel!

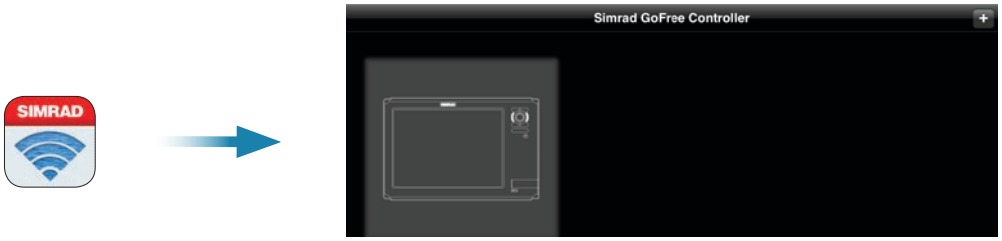
Connecting the wireless device to the WIFI-1

Set up the wireless device's network to be the WIFI-1 defined as primary access point.

- The **Network name** is found in the NSO-II menu. Refer to "Setting up the WIFI-1" on page 95.

Enable/disable wireless control of NSO-II

1. Download the Simrad GoFree Controller & Viewer App from the application store to the wireless device.
2. Start the App, and tap the NSO-II icon in the GoFree Controller page to request remote control of the NSO-II.



The first time you request control from the wireless device, the NSO-II will prompt you to confirm remote control from this device.

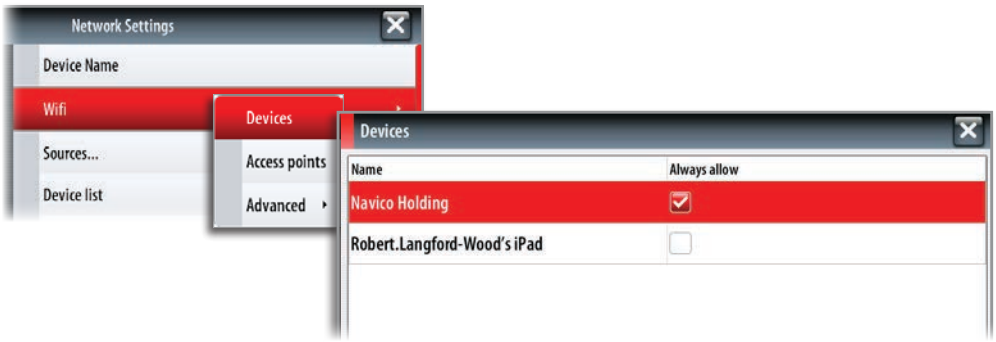
You have the following options:

Yes	Allows control from the wireless device as long as the device is connected to the WIFI-1 network. You will have to request remote control again if the wireless device later re-connects to the WIFI-1 network.
No	Allows no control from the wireless device. The NSO-II display can be viewed on the wireless device, but no operation is allowed.

Always	Allows control of the NSO-II from this wireless device until you choose to disable the control. See description later in this section.

When control is confirmed, the connection is immediately established.

All wireless devices that are allowed to control the NSO-II are listed in the Wifi device list.



Disabling wireless control

You disable wireless control from a remote device as follows:

1. In the device list, select the wireless device you want to disable
2. Uncheck the Always allow option

3. Press and hold on the selected line in the list to show the menu

4. Select **Disconnect**
5. On the wireless device, select the view only option

You can now view the NSO-II display on the wireless devise, but no operation is allowed.

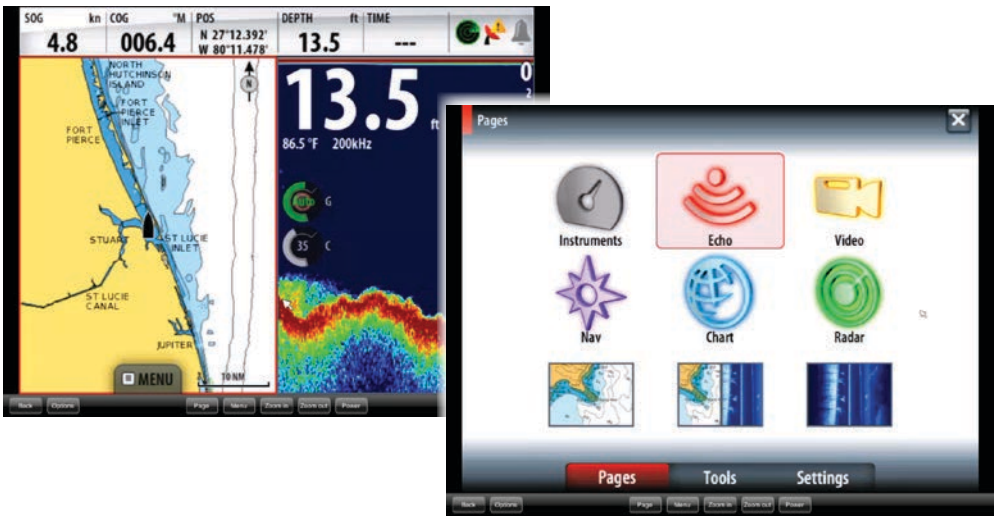
Wireless control of the NSO-II is re-established by re-starting the App and confirming remote control.

➔ ***Note:*** If control is rejected the wireless device will mirror the NSO-II screen, but no operation is allowed from the remote device.

All connected wireless devices will be listed in the NSO-II dialog, and you can change the access level for all connected devices.

Operating the NSO-II with a wireless device

When remote control is accepted, the NSO-II page will be mirrored to the wireless device.



The NSO-II image includes softkeys:

PAGES, MENU, ZOOM IN, ZOOM OUT, POWER, ENTER, CANCEL, GO TO, MARK, MOB.

Tapping these keys works as operating the similar hard keys on the OP40 Remote Control.

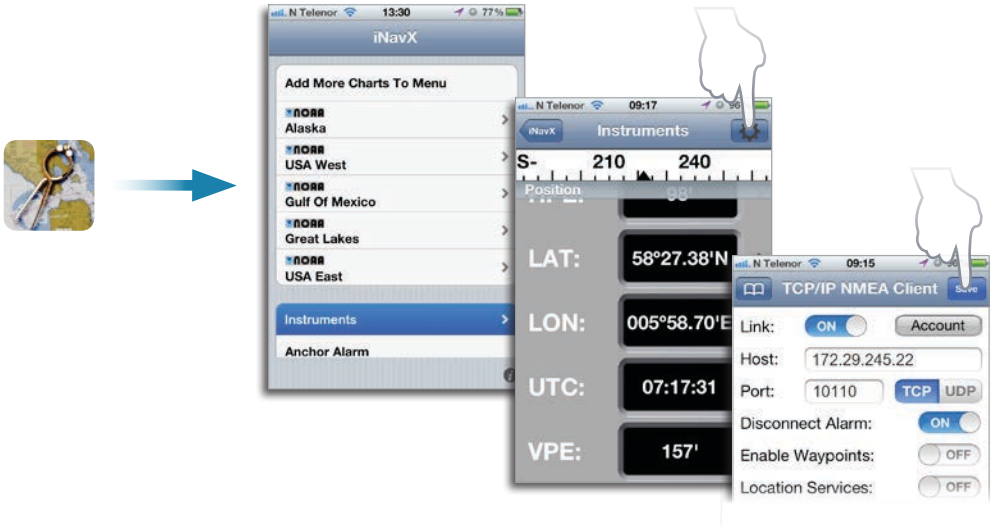
Lets you select which NSO-II to control if more than one is connected to the active WIFI-1 unit

Returns to the GoFree Controller page.

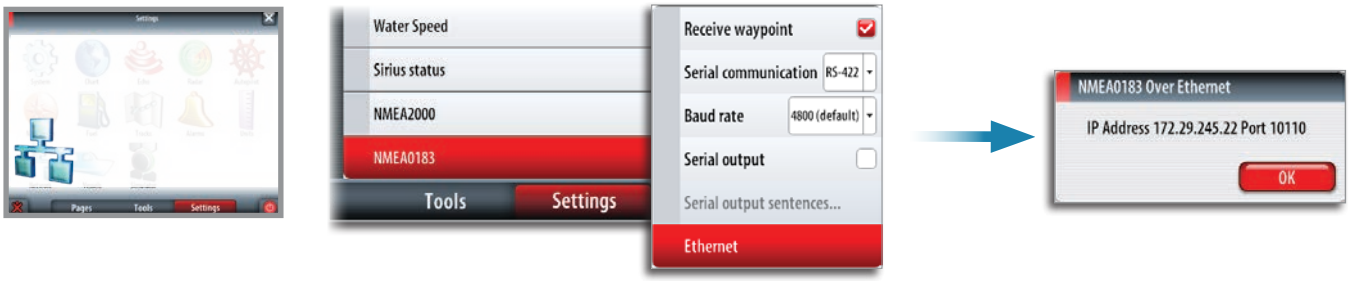
Using the WIFI-1 for data bridging

The WIFI-1 can be used for bridging data from the NSO-II to other applications running on a wireless remote device.

The graphics below is an example only, showing setup for the iNavX application run on an iPhone.



IP address and port information is found in the NSO-II as shown below.



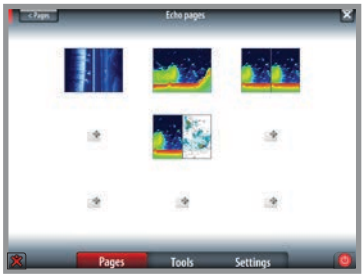
20 Customizing your system

Page overview

Pages group overview

The **Pages** group overview is pre-configured with 6 page groups and with 3 shortcut icons to Autopilot panel, to a combined Chart/Echosounder panel, and to the StructureScan™ panel.

The pre-configured shortcuts can be removed or modified by the user.



Page group panels

Each of the 6 page group panels are pre-configured with a combination of pages:

The main page in each group is a full size panel. All pre-configured pages, except the main page for the page group, can be modified by the user.

Each page group can have up to 9 pages, organized as single panels or as a combination of panels. You can also define your own pages.

Create favorite pages

You can edit a pre-configured page or define your own pages from the page editor.

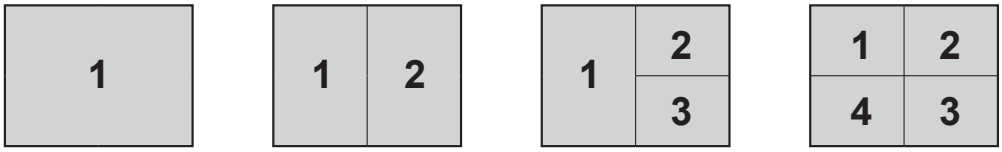
1. Tap and hold on an empty page icon or a pre-configured page icon. You can also select the icon with the OP40 rotary knob and then pressing the OP40 **MENU** key.

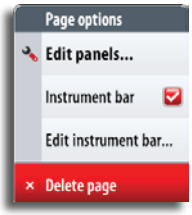
- Tap the **Add new page...** to display the page editor panel

2. Select the panel icon one by one to set up your custom pages
3. Save the page layout by tapping the **Save** button.

You can have several panels on each page.

The panels are arranged as illustrated below.





Deleting a page

All pre-configured and user defined pages, except the main page for the page group, can be deleted.

1. Tap and hold on the page icon for the page you want to remove. You can also select the icon with the OP40 rotary knob and then pressing the OP40 **MENU** key.
2. Select the delete option from the menu.

Setting the appearance of the instrument bar

Data sources connected to the system can be viewed in the instrument bar at the top of your pages.

You can choose to turn the instrument bar off, display either one or two rows, or set it to alternate the rows automatically.

Turning the databar on/off

1. Tap and hold on the page icon for the page you want to edit.
2. Toggle on/off the instrument bar from the menu.

Changing the appearance of the databar

1. Tap and hold the instrument bar at the top of the dialog to get access to the edit mode.

2. Tap the instrument field to change, and select the type of information you want to display
3. Define the appearance for both rows, and the time period if you want the rows to alter automatically
4. Save your changes by tapping the **Close** button.

Changing system settings

The system settings provide access to advanced settings for your system and determines the way your system displays various user interface information on the display.

Language
Controls the language used on this unit for panels, menus and dialogs. Changing the language will make the unit re-start.

Text size
Used for setting the text size in menus and dialogs.

Default setting: Normal

Key beeps
Controls the loudness of the beep sound when a key is pressed.

Default settings: On

Time
Controls the local time zone offset, and the format of the time and date.

Audio
Used for activating the audio media bar at the bottom of the pages.

Screen capture
Press the **PWR** key and the **PAGES** key simultaneously to capture an image from the screen. The image files can be moved or copied to an SD card.

This feature is only available for touch monitors.

Restore defaults
Allows you to select which settings are to be restored to their original factory settings.

Power control
Controls whether this unit is a master or slave on the network.

Advanced
Shows a dialog with more advanced settings.

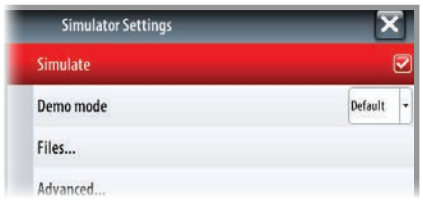
About
Displays copyright information and technical information for this unit.

21 Simulator

Simulator mode

The simulation feature will let you see how the unit works in a stationary position and without being connected to echosounder, radar, GPS etc.

You can use the simulator to help you become familiar with your unit before using it out on the water.



When the simulator is toggled on this is indicated in the lower part of the display.

Demo mode

In this mode the unit automatically runs through the main features of the product; it changes pages automatically, adjusts settings, opens menus etc.

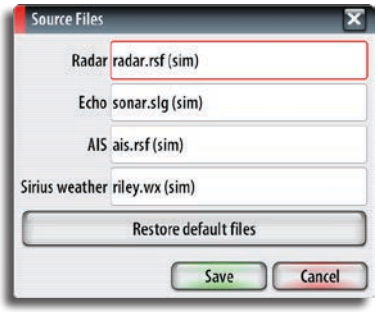
If you tap the screen or press a key when demo mode is running, the demonstration will pause. After a time-out period, demo mode will resume.

Selecting simulator source files

You can select which data files to be used by the simulator.

A set of source files is included in your system, and you can import files by using an SD card inserted into the unit's card reader on the processor box.

You can also use your own recorded echosounder files in the simulator.



See "Recording echosounder data" on page 58 for information about how to record sounder files.

Advanced simulator settings

The advanced simulator settings allow you to define how to run the simulator. When the settings are saved these will be used as default when starting the simulator mode.

GPS source

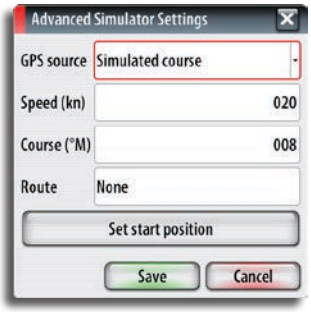
Selects where the GPS data is generated from.

Speed, Course and Route

Used for manually entered values when GPS source is set to Simulated course or Simulated route. Otherwise, GPS data including speed and course comes from the selected echosounder or radar files.

Set start position

Moves the vessel to current cursor position.



22 Maintenance

Preventive maintenance

The NSO-II unit does not contain any field serviceable components, therefore the operator is required to perform only a very limited amount of preventative maintenance.

It is recommended that you always fit the supplied protective sun cover when the unit is not in use.

Simple maintenance procedures

Cleaning the display unit

The supplied cleaning cloth should be used to clean the screen, where possible. Use plenty of water to resolve and take away salt remains. Crystalized salt may scratch the coating if using a damp cloth. Apply minimal pressure to the screen.

Where marks on the screen can't be removed by the cloth alone, use a 50/50 mixture of warm water and isopropyl alcohol to clean the screen. Avoid any contact with solvents (acetone, mineral turpentine etc.), or ammonia based cleaning products, as they may damage the anti-glare layer or plastics bezel.

To prevent UV damage to the plastic bezel, it is recommended that the sun cover be fitted when the unit is not in use for an extended period.

Cleaning the media port door

Clean the media port door regularly to avoid that salt crystallize on the surface, causing water to leak into the card slot.

Checking the keys on OP40 Remote controller

Make sure that no keys are stuck in the down position. If one is stuck, wiggle the key to free it back to normal.

Checking the connectors

The connectors should be checked by visual inspection only.

Push the connector plugs into the connector, if the connector plugs are equipped with a lock; ensure that this is in the correct position.

Software upgrades

The latest software for the NSO-II will be available for download from our website; www.simrad-yaching.com

Detailed instructions for how to install the software will follow the upgrade files.

For more details about software upgrades, refer to the separate Installation manual.

Trouble shooting

Failure	Corrective action
One or more functions do not operate as normal	Perform a back to factory as described in "Restore defaults" on page 100
Normal operation is not possible and back to factory does not fix the problem	Switch off the unit, press and hold the zoom in and out keys on OP40 and switch on the unit. Release the zoom keys after some 5-6 seconds. A second beep confirms the reset

Backing up your system data

Waypoints, routes, tracks that you create are filed in your system. It is recommended to regularly copy these files and your system settings files as part of your back-up routine.

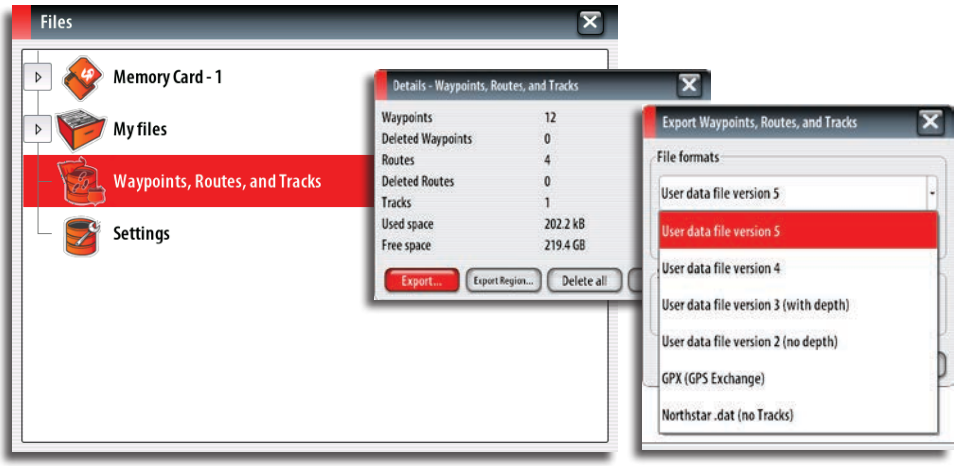
The files are copied to an SD card inserted in the card slot on the processor box.

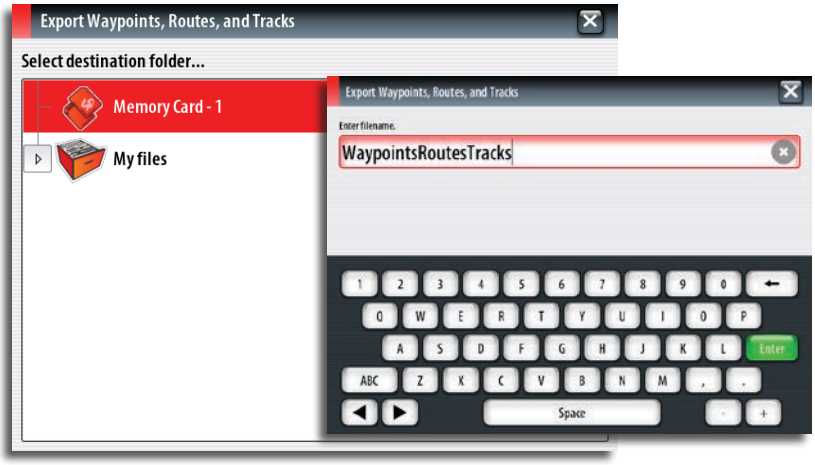
Different output formats are available:

User Data File version 5	This is used to import and export waypoints and routes with a standardized universally unique identifier (UUID), which is very reliable and easy to use. The data includeds such information as the time and date when a route was created etc.
User Data File version 4	This is best used when transferring data from one NS* system to another, since it contains all the extra bits of information these systems store about items.
User Data file version 3 (w/depth)	Should be used when transferring user data from an NS* system to a legacy Lowrance (LMS, LCX, etc)
User data file version 2 (no depth)	
GPX (GPS Exchange)	This is the format most used on the web that shares among most GPS systems in the world. Use this format if you are taking data to a competitors unit.
Northstar.dat (no Tracks)	Used to transfer data to a legacy Northstar device.

The example shows how to export waypoints, routes and tracks. Selection is done by using the OP40 rotary knob or the menu.

1. Select Files from the Tools dialog
2. Press the OP40 rotary knob to access the export dialog, and select the file format you want to export to
3. Select destination folder
4. Enter name for exported file.



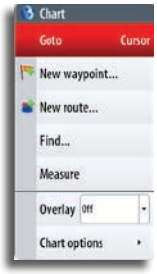


23 Menu and dialog overview

Panel menus

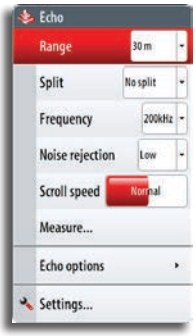
The graphics below shows panel specific menus with and without active cursor on panel. Tap the **MENU** button or tab and hold on the panel to call up the panel menu.

Chart

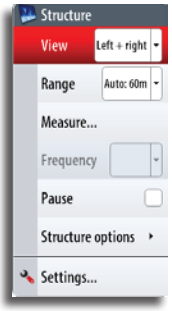


→ *Note:* Chart menu will be extended if overlay is selected.

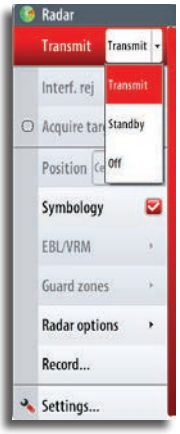
Echo

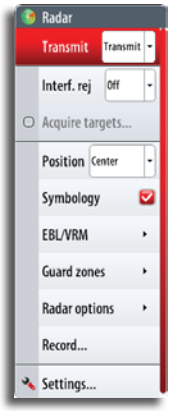


Structure

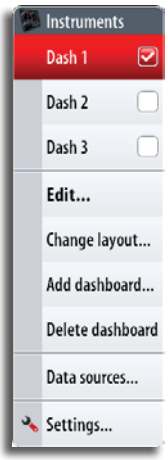


Radar

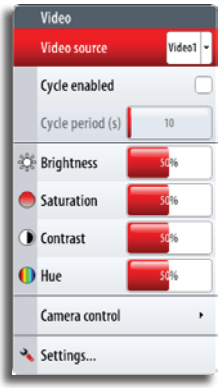




Instruments



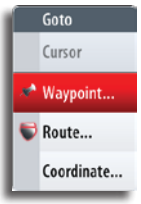
Video



Autopilot

Goto menu

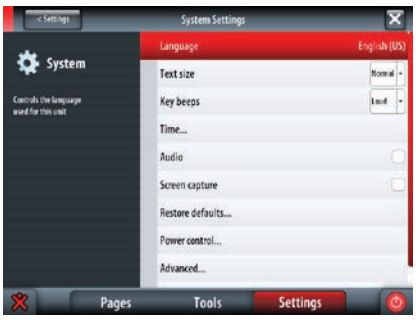
This menu is displayed on any panel by pressing and holding the OP40 **GO TO** key.



Settings dialogs

The **Settings** overview page is available by selecting the **PAGES** button and then Settings.

System settings



Echosounder settings

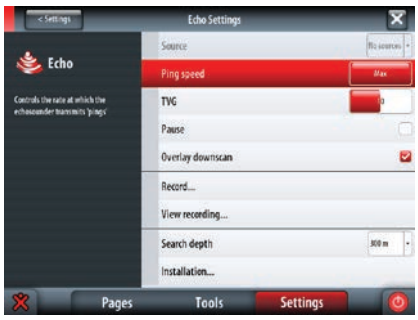
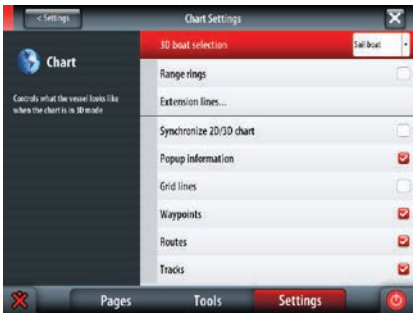
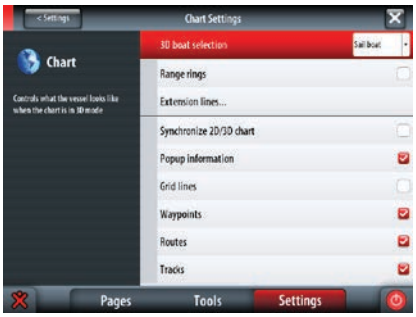


Chart settings

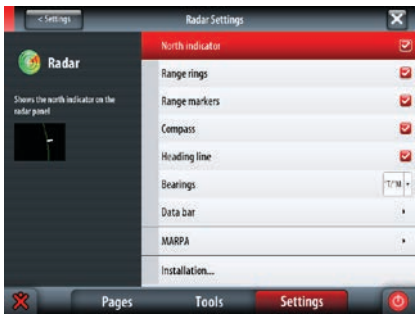
Insight chart database



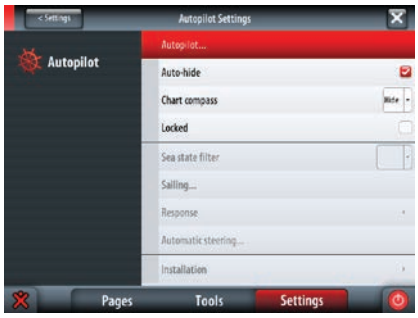
Navionics chart database



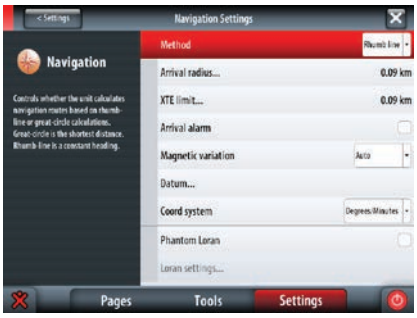
Radar settings



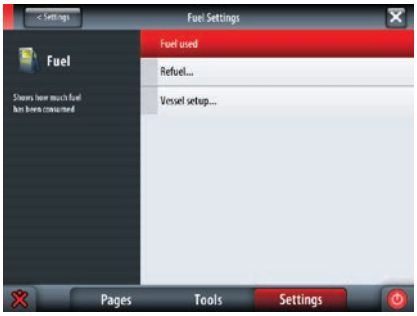
Autopilot settings



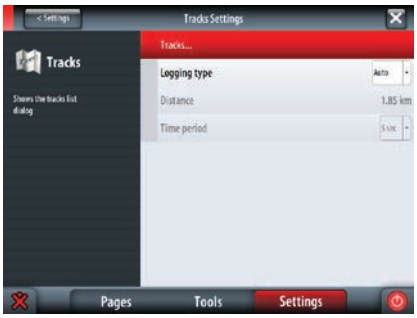
Navigation settings



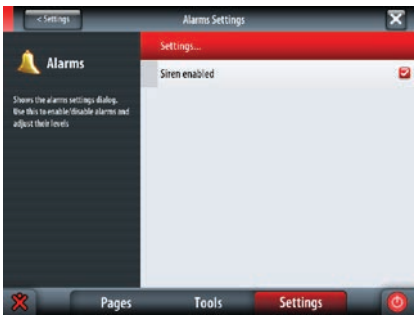
Fuel settings



Tracks settings

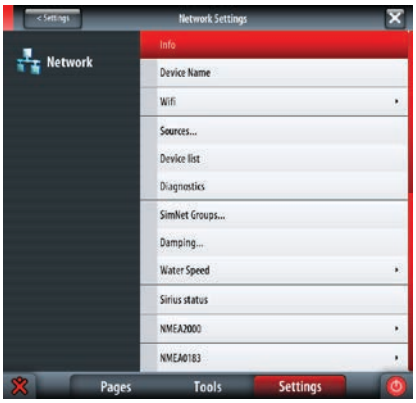


Alarms settings

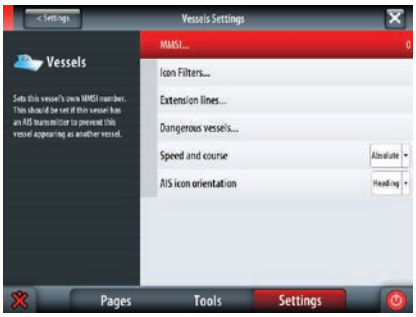


Units settings

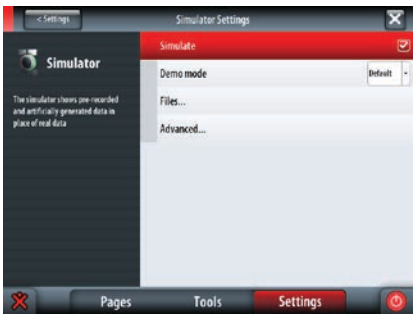
Network settings



Vessels settings



Simulator settings



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